PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Vol. 113, No. 21 Thursday, November 20, 1941 Price Ten Cents

Reduces Call for Paper to Three Months

Joint Printing Committee In Asking Bids For U. S. Printing Offices Changes From Usual Six Months Period and Also Reduces Quantities To Sixty Per Cent of Amount In Printed Specifications.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 17, 1941—Joint Congressional Committee on Printing today took unprecedented action when it changed conditions for the paper bid opening for the Government Printing Office of November 24.

Changes from Original Specifications

The Joint Committee authorized the public printer to notify all paper bidders and prospective bidders that the opening on November 24 will be for a period of three months instead of six months or from January 1st to March 31, 1942, and that the quantities in the specifications will be reduced to sixty % of the amount printed in the specifications. Also that the option relating to additional quantities of paper overrun is to be not in excess of ten percent of the estimated quantities. This important action was taken following a conference called here Saturday by the public printer at which seventy-six representatives of paper concerns were in attendance. The public printer was informed that owing to the present emergency it would probably be impossible to get bids on November 24 for the six months supply called for.

Telegram Sent to Paper Concerns

The following telegram was sent out tonight to all paper concerns and jobbers who have invitations to bid. "The Joint Committee on Printing has this day directed the public printer to inform all bidders that the following changes are hereby made in the printed proposal for furnishing paper for public printing and binding: 1, The term of the proposal as stated on page 1 and elsewhere is reduced from six months to three months thus commencing January 1 and ending March 31, 1942: 2, The approximate estimated quantities as stated on page 1 of specification and for each lot number in the schedule, pages 13 through 62, are reduced to sixty per cent of the original printed amount in the proposal: 3, The option authorizing the fifty per cent overrun, contained in paragraph 15 is modified so that call shall not be made by the Government Printing Office for any amount upon any one specification in excess of ten per cent of the estimated quantity. Only bids conforming to all of the foregoing changes will be considered. As no extension of time can be granted sealed proposals must be received not later than ten A.M. November 24. Bidders will use the printed form already distributed to them under the advertisement. In subscribing to the printed form on page 65 bidders should state that their proposals are 'subject to the three amendments of specifications contained in the telegram from the public printer, dated November 17, 1941.' In any event the three changes in specifications announced in this telegram will be made a part of all proposals submitted by bidders, and any provision in the printed form in conflict therewith is hereby amended so as to be consistent with the foregoing changes. Telegraph or telephone public printer if any phase of the changes or the procedure is not understood." The telegram is signed by the public printer.

Conference Called Last Week

Due to the fact that the Government Printing Office has been receiving very few bids recently for large quantities of paper, the public printer called a conference on Saturday of last week. During the discussion of the paper situation various representatives of mills expressed the opinion with the country facing a rapidly rising market it would be difficult for bidders to make reliable estimates of their costs on a basis over a six months' period. They explained that in view of such conditions any bids received would be likely to be priced so as to provide for the contingency of greatly rising costs over the period, a situation which would not result in the most favorable contracts to the Government. This is the principal reason that the sudden change was made in the term of the contract.

Might Have Bad Effect on Bidding

The representatives of the paper mills at the conference also questioned the propriety at this time of including the provision in the specifications that a contractor must furnish the estimated quantities called for and in addition not to exceed fifty per cent of such amount upon call of the Government. Under the present specifications the Government Printing Office may order any part of the estimated quantity

(Continued on page 42)

Paper Industry Must Consume Less Chlorine

Director of Priorities In Order Issued November 15 Defines Brightness of Paper Grades — Bleaching To Be Eliminated For Most Wrapping, Bag and Specialty Papers — Reduction 50 Per Cent.

A decreased use of chlorine in the manufacture of pulp, paper and paperboard, effective immediately, was ordered today by the Director of Priorities, in General Limitation Order L-11, issued by Donald M. Nelson, Director of Priorities, Office of Production Management on November 15.

The result will be less whiteness, or "brightness" in the idiom of the paper trade, in practically all grades of paper. The changes will be noticeable, it was said, on close examination but will not be observable on casual inspection.

In general, all grades of paper will correspond to the standards of 1931-32. Since that time increased use of chlorine has resulted in whiter papers.

Chlorine is used as a bleach in the manufacture of paper and pulp, eating out all foreign matter and increasing the white quality. In some of the lower grades of paper now in use, where the cuts in the use of chlorine are heaviest, a slightly yellow cast may result.

It is expected the order will save 60,000 tons of chlorine a year, which is half the new chlorine entering the paper manufacturing industry annually. All of the chlorine saved will go directly into national defense uses.

Chlorine enters into many phases of defense production. Among its important uses are in the manufacture of plastics for degaussing cable used to make ships immune to magnetic mines; in the manufacture of waterproofing parafins for canvas; as a solvent in armament plants; in the manufacture of guncotton; as a coolant for liquid-cooled airplane engines; in the manufacture of non-freezing dynamite, and in chemical warfare.

Practically all grades of paper are affected by the order, with the exception of newsprint, in which no chlorine is used. Brightness ceilings are provided, ranging from a cut of 4 points in 100% rag content writing paper to total elimination of chlorine in groundwood, the grade commonly used in "pulp" magazines and books. Bleaching also is eliminated for most bags, sacks and wrapping paper and for specialty papers, such as sand paper base.

The order does not apply to stocks on hand produced prior to the applicable dates of the order. No restriction is placed on the use of chlorine for sanitary purposes. Producers who manufacture their own chlorine are required to comply with the terms of the order.

Regulations are set up on a quarterly-period basis, with various percentages fixed for the use of chlorine as compared to the three-month period ending July 31, 1941.

Whereas, the production of pulp, paper and paperboard consumes large quantities of chlorine; national defense requirements have created a shortage of chlorine; action has already been taken to conserve the supply and limit the use of chlorine in the production of pulp, paper and paperboard in order to insure its availability for essential defense and civilian requirements; increasing diversion of chlorine to defense uses requires further restrictions of its use in such production:

990.1 General Limitation Order

(a) Definitions. For the purpose of this order.

(1) "Producer" means any individual, partnership, association, corporation or other form of business enterprise, engaged in the manufacture of pulp, paper or paperboard.

(2) "Brightness" means the degree of brightness determined by the General Electric Brightness Tester.

(3) "Semi-bleached grade" means that grade of pulp which prior to June 16, 1941, had a brightness of less than 70.

(4) "Calendar quarterly period" means the quarterly period commencing on the first day of the second, fifth, eighth, and eleventh months of the calendar year and ending, respectively, on the last day of the fourth, seventh, tenth, and first months of the calendar year.

(b) General Restrictions Relating to Pulp, Paper and Paperboard.

(1) No Producer subject to this order shall, after the effective dates of the applicable provisions hereof, use chlorine in a quantity in excess of that specifically authorized herein or increase the brightness of pulp, paper or paperboard in excess of the degrees of brightness established herein.

(2) No Producer shall increase the brightness of any pulp, paper or paperboard to a degree greater than the brightness of like pulp, paper or paperboard produced by him on June 11, 1941.

(c) Specific Restrictions Relating to Pulps, Effective November 1, 1941.

The following restrictions in the use of chlorine shall become effective November 1, 1941:

(1) No Producer in any calendar quarterly period shall use more chlorine in the bleaching of rag stock than 80% of his use of chlorine for similar purposes during the three-month period ending July 31, 1941.

(2) Except as provided in (c)(4) and (c)(6) hereof, the brightness of the following pulps shall not exceed 74:
(i) Bleached Sulphite
(ii) Bleached Sulphate

(3) Except as provided in (c)(4) and (c)(6) hereof, the brightness of the following pulps shall not exceed 70:
(i) Soda Pulp
(ii) Waste Paper when used for conversion into bleached papers.

(4) The brightness ceilings established in (c)(2) and (c)(3) hereof may be exceeded to the extent that the Office of Production Manage-

ment may permit upon application accompanied by satisfactory proof that the applicant's process of achieving a higher brightness will further the program for the conservation of chlorine embodied in this Order. Such applications should be addressed to the Office of Production Management, and marked Ref: L-11.

(5) No producer in any calendar quarterly period shall use more chlorine in the production of semi-bleached grades than 70% of his use of chlorine for similar production during the three-month period ending July 31, 1941.

(6) Notwithstanding the limitations set forth in (c)(2) and (c)(3), any producer in any calendar quarterly period may use, per ton of pulp produced for the following purposes requiring the use of chlorine as a processing, rather than as a bleaching agent, an amount of chlorine necessary for such processing, provided that in no case shall he use more chlorine per ton of pulp produced than he used for similar purposes during the three-month period ending July 31, 1941:

(i) In the processing into paper stock of rope, jute, hemp, flax, Sunn fiber, Benares fiber or like fibers;

(ii) In the processing of pulp for use in the manufacture of sanitary pads, hospital wadding, or wadding for use in the filtering or dissolving and nitrating pulps.

(7) Except for (i), (j), (k), (l), (m), and (n) hereof, this Order shall not apply to the following pulps:

(i) High Alpha Pulp (not less than 90% Alpha Cellulose content)

(ii) Dissolving Pulps

(iii) Nitrating Pulps

(iv) Pulps used in the manufacture of photographic base papers.

(d) SPECIFIC RESTRICTIONS RELATING TO PAPER AND PAPERBOARD, EFFECTIVE NOVEMBER 10, 1941.

(1) Except as provided in (d)(2) hereof, after November 10, 1941 the brightness of the following grades of paper and paperboard shall not exceed the brightness ceilings specified below:

Division of Industry	Grades	Brightness Ceilings
Blotting Book	All grades	70
	A & B grades, including M. F. Super and Antique	72
	Book Publication Grades Rotogravure	72
	M. F. and Super Litho and Label	72
	Machine-coated grades	72
	Offset	70
	Envelope	70
	C. D. & E grade book, including M. F., Super and Antique	68
	Tablet	68
	Drawing	68
	Poster	68
	Hanging	68
	End Leaf	68
	Band Stock	68
	Linings	68
	Gumming	68
	Carbonizing	68
	Body Stocks for all coated, other than machine-coated	68
Bristol and Index	No. 1 Grades	74
	No. 2 Grades	71
	No. 3 Grades	68
Cardboard	All grades uncoated and coating base stock	68
Groundwood	All grades	67
Kraft	Brown Envelope	40
Sulphite and Bleached Kraft	Bleached Group including M. F. and M. G. Waxing, Drug Wrapping and Fully Bleached Bag	67
	M. F. and M. G. Opaque Waxing wither beater filled or coated	70
	Unbleached Group including Butchers Manila, Steam Finish and Dry Finish Grocers, Screenings, etc.	60
	Bag papers, Imitation Parchment and All Other Envelope Manila and Wrapping Manila	60
Tissue	M. G. Wrapping	60
	Toilet and Towel	67
	Facial Cleaning	68
	Wrapping Tissue No. 1 Grade	70
	Waxing Tissue	67
	Napkin Stock	70
	Carpet Twisting	62
	Creping Tissue	70
	Kraft and Sulphite Fruit and Vegetable Wrap	60
Writing	Rag Content Papers	
	100% Grade	82
	75% Grade	80
	50% Grade	77
	25% Grade	75
	Sulphite Papers, Writing Ledger, Bond, and Mimeograph	
	No. 1 Grades	74
	No. 2 Grades	73
	No. 3 and 4 Grades	70
Specialty Paper & Paperboard	File Folder Stock	62
	White Tag Stock	68
	All other Tagboard	62
	Lined and solid unbleached paperboard	62
	Bogus Bristol	68
	Mill Blanks	68
	Lined and solid bleached paperboard	70
	White patent coated paperboard	70

(2) The brightness ceilings established in (d) (1) hereof, may be exceeded to the extent that the Office of Production Management may permit upon application accompanied by satisfactory proof that the applicant's process of achieving a higher brightness will further the program for the conservation of chlorine embodied in this Order. Such application should be addressed to the Office of Production Management and marked Ref: L-11.

(e) ELIMINATION OF CERTAIN PULPS FROM SPECIFIED GRADES OF PAPER AND PAPERBOARD, EFFECTIVE NOVEMBER 10, 1941.

(1) After November 10, 1941, all pulp bleached with chlorine shall be eliminated from the following grades of paper and paperboard:

Division of Industry	Grades
Groundwood	A-1 Groundwood Catalog
	A-1 Groundwood Carbonizing
	A-1 Groundwood Coating
	A-1 Groundwood Board and Box Lining
Kraft	All grades of semi-bleached bags and sacks, which prior to June, 1941, were of 62 brightness or less
	Asphalting Kraft Papers
	Tile Mounting
	Creping
	Twisting
	Spinning
	Tire Wrap
	Coin Wrap
	Gummings and Tape, and Waxings
Specialty Paper and Paper Board	Sand Paper Stock
	Insulating
	Pattern Board
	Beaming Paper
	Stencil and
	Cable Stock

(f) EXCEPTION AS TO STOCKS ON HAND AND IN TRANSIT. No provision of this Order shall be construed to apply to pulp, paper or paperboard produced prior to the respective applicable dates contained herein.

(g) EXCEPTION AS TO USE OF CHLORINE TO DESTROY BACTERIA. No provision of this Order shall be construed to restrict the use of chlorine for reduction of bacterial count, for slime control or for sanitary purposes, below the minimum amounts necessary for such uses.

(h) OWNERSHIP BY PRODUCERS OF CAPTIVE SUPPLY OF CHLORINE. Producers who also manufacture their own supply of chlorine shall observe the provisions of this Order in all respects.

(i) RECORDS

(1) Each producer of any pulp referred to in (c) hereof shall keep and preserve for not less than two years, accurate and complete records, on a calendar month basis of

(i) Total incoming deliveries of chlorine;
(ii) Total production of chlorine (if any);
(iii) Total chlorine consumption;
(iv) Production of each type and brightness of pulp referred to in (c) hereof, and the quantities of chlorine used in the production of each such type and brightness;
(v) The quantities of chlorine consumed for each of the purposes referred to in (g) hereof;
(vi) The quantity of chlorine on hand at the end of each month.

(2) Each producer of paper or paperboard shall keep and preserve for not less than two years, accurate and complete records, on a calendar month basis, of the quantity of each type of pulp, and the brightness thereof, used in his production of each of the kinds, grades and brightnesses of paper and paperboard listed in (d) and (e) hereof, and the quantity produced of each such kind, grade and brightness of paper and paperboard.

(j) REPORTS

All persons affected by this Order shall execute and file with the Office of Production Management such reports and questionnaires as said office shall from time to time request. No reports or questionnaires are to be filed by any person until forms therefore are prescribed by the Office of Production Management.

(k) AUDIT AND INSPECTION

All records required to be kept by this Order shall upon request be submitted to audit and inspection by a duly authorized representative of the Office of Production Management.

(l) VIOLATIONS OR FALSE STATEMENTS

Any person who violates this Order, or who wilfully falsifies any records which he is required to keep by the terms of this Order, or by the Office of Production Management, or otherwise wilfully furnishes false information to the Office of Production Management may be deprived of priorities assistance or may be prohibited by the Director of Priorities from obtaining any further deliveries of materials subject to allocation. The Director of Priorities may also take any other action deemed appropriate, including the making of a recommendation for prosecution under Section 35A of the Criminal Code (18 U.S.C. 80).

(m) SUPERSEDING EARLIER ORDER

This order shall supersede as of its date of issuance all directions respecting the use of chlorine by producers of pulp, paper and paperboard contained in directives issued on July 11 and September 8, 1941.

(n) EFFECTIVE DATE

This order shall take effect upon its date of issuance except that sections (c), (d), and (e) hereof shall not become effective until the respective dates specified in those sections.

(P. D. Reg. L, Aug. 27, 1941, 6 F. R. 4489; OPM Reg. 3 March 8, 1941, 6 F. R. 1598, as amended Sept. 12, 1941, 6 F. R. 486; E. O. 8629, Jan. 7, 1941, 6 F. R. 191; E. O. 8875, Aug. 28, 1941, 6 F. R., 4483; Sec. 2(a), Public No. 89, 77th Congress, First Session; Sec. 9, Public No. 783, 76th Congress, Third Session.)

To Expand Corrugating Plant

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 17, 1941—To meet the continuing trend upward in demand for its products, Canadian Wirebound Boxes, Ltd., is adding a second story to its corrugating board plant here. This means an addition of some 40,000 square feet of floor space and makes room for considerable equipment now on order and expected to be installed early in January. The new production equipment will allow an expansion in corrugated board capacity of some 50% over the normal rate for this division. The current level of operation is, of course, well above the normal rate. Canadian Wirebound recently completed a re-arrangement of production facilities in the wirebound box division which is allowing a more efficient production schedule.

Sales of the company are currently largely governed by plant capacity with business volume understood to be well ahead of the same time a year ago. The accelerated demand has been felt throughout all divisions of the organization. Little change has taken place in the price structure of Canadian Wirebound's products recently and company sources do not believe, for the present at least, that the new Federal price ceiling order will have much influence on their business.

Hearings on Power Completed

Hearings have been completed at Marinette, Wis. on the application of the Wisconsin Michigan Power Company for a federal power commission license for the construction, operation and maintenance of the utility's hydro-electric development on the Michigamme River, on the borderline between Wisconsin and Michigan. W. E. Schubert, general manager, and J. S. Wells, assistant chief engineer, appeared for the power company.

The license would cover the company's reservoir and hydro-electric plant east of Crystal Falls, Mich., on which construction was started last summer.

Marvin Farrington, trial examiner for the commission, conducted the hearing, which had been adjourned from Washington, D. C. to Marinette because of the availability of witnesses. The new expansion would tie in with the utility's generating plant at Appleton, Wis., to help overcome a prospective power shortage among mills in the Fox River Valley.

Tomahawk Co. Successful Bidder on Timber

Under Selective Cutting Plan Offer of Tomahawk Kraft Paper Co. On 50,000 Acres of Forest Land Has Been Accepted By U. S. Government — No Priority On Fourdrinier Wire — Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 17, 1941—Merchantable timber on 50,000 acres in the Superior National Forest in Minnesota will be cut within the next ten years by the Tomahawk Kraft Paper Company, Tomahawk, Wis., to augment its pulpwood supply, according to announcement made last week by Jay H. Price, regional U. S. forester at Milwaukee, Wis.

The Tomahawk company was the successful bidder on the timber offered for sale by the government under a selective cutting arrangement. It is the largest cutting to be made in the nine-state region since it was established in 1929. Operations are to begin January 1, 1942, with a minimum of 30,000 cords and a maximum of 100,000 cords of pulpwood specified for each three-year period. Shipping headquarters will be established at Babbitt, Minn.

Estimated proceeds of the contract totalled $257,570 on a basis of the anticipated yield of various kinds of merchantable timber. It includes 198,000 cords of jack pine, 28,000 cords of spruce, 3,200 cords of balsam fir pulpwood, 1,100,000 board feet of red pine, 2,300,000 board feet of aspen sawtimber, 8,000 birch railroad ties and 11,000 cedar ties.

Nekoosa-Edwards Raises Wages

Wage increases of three cents per hour for all hourly workers was announced last week by the Nekoosa-Edwards Paper Company through John E. Alexander, president and general manager. The increase will include approximately 1,325 workers at the company's mills at Nekoosa and Port Edwards, Wis., and is effective as of November 2, 1941. The hourly base rate is now 58 cents, with the increase. Mr. Alexander announced that the wage raise in no way affects any other provisions of its contract with the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, the International Association of Machinists and the International Brotherhood of Papermakers.

No Priority on Fourdrinier Wire

Manufacturers of paper machine wires in the Fox River Valley have been notified by the Office of Production Management in Washington, D. C. that they will not be affected by a recent order restricting the use of wire in non-defense plants. The order had been issued by Donald Nelson, director of the Supplies, Priorities and Allocation Board.

This is in line with the government's desire that paper mills step up their production to meet defense demands, and assures them all needed wires to accomplish this.

A new order will be issued within two or three weeks covering this situation, but in the meantime exemptions will be allowed where application is made to the Pulp and Paper branch of OPM in Washington.

Both the Appleton Machine Company and the Valley Iron Works Company, Appleton, Wis., are using part of their foundry and machine divisions on defense contracts. The former is turning out about 70 tons of iron castings per month for the machine tool industry, and is machining armor steel for gun turrets and M-28 tank shields.

Curtis Flieman To Manage Waste Plan

Curtis Flieman of Milwaukee, Wis., has been engaged as operating manager for the Appleton Plan for Recovery of Waste Paper at Appleton, Wis., complying with the government's request to set up a national plan for use of various cities. Mr. Flieman is establishing an office in the city hall, and expects to have the plan in operation in about two weeks.

Kimberly-Clark and Union Sign Agreement

Otto Hannemann, president of the Paper Mill Workers Union at Kimberly, Wis., has announced that an all-union agreement has been signed between the union and the Kimberly-Clark Corporation. The agreement followed an employees' election at the Kimberly mill in October. More than 90 per cent of the employees are now in the union. The agreement provides that all hourly paid workers must now become members.

Suit Involving Appleton Co. Settled

Settlement of a $30,000 damage suit was made for $550 in which the Appleton Coated Paper Company, Appleton, Wis., was a co-defendant with the Olson Transportation Company. The suit was brought by Mrs. Clara Sattell of Wilwaukee, who claimed injuries suffered in a fall by her husband caused his death. The transportation company leased the property from the paper company. The settlement was reached after trail had opened in the circuit court at Appleton.

Everest and Truttschel Nuptials

David Clark Everest, Jr., of Wausau, Wis., and Miss Patricia Toomey of Schofield, Wis., were married in a elaborate ceremony at St. John's Episcopal church at Wausau Saturday evening, November 8. A reception for 350 guests was held afterwards at the Wausau Club. Mr. Everest's father is president and general manager of the Marathon Paper Mills Company, Rothschild, Wis.

Paul E. Truttschel, technical assistant in the analytical department of the Institute of Paper Chemistry, Appleton, Wis., and Miss Mary Agnes Beard, who was a member of the Institute's secretarial staff, were married Saturday afternoon, November 15, at Memorial Presbyterian church at Appleton.

Inland Container to Erect New Office

Construction of a new office building has been announced by the Inland Container Corporation, Milwaukee, Wis., the contract for which has been awarded to the Hunzinger Construction Company. It will be located adjacent to the company's plant at 714 E. Keefe avenue. The building will be of modern fireproof design, and its estimated cost is $12,000.

Clamor For Paper Is Unabated in Chicago

Heavy Buying and Possible Fixing of Maximum Prices On Coarse Paper Are Major Points of Discussion In Market — OPA Representative Cautions Envelope Manufacturers — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 17, 1941—Threatened with ceilings on coarse paper, relieved that the effective date of paper board schedule 32 has been postponed to November 1 with filing December 20 and about frantic over the job of taking care of customers, Chicago's paper trade went through another hectic week. When the story of this present emergency is written it is the feeling locally that the paper industry will receive high commendation for its efforts to regulate itself. Operating and production costs have gone sky high and the threat of increased taxation has forced a consideration of much higher prices to take care of these factors. Most creditable work has been done by local advisory committees who have even developed facts and figures far in advance of the deadline set by the Government itself.

Aside from these "extra-curricular" activities, the markets are experiencing a boom, as buyers are stocking up as much as possible.

OPA Official Cautions Envelope Men

An official of the Office of Price Administration told a Chicago conference of envelope manufacturers that they had better be careful about "inflationary price boosts" and urged cooperation in conservation of waste paper, suggesting that huge quantities could be saved through discontinuance of handbills and shoppers guides. Maxwell Grossman, chief of the waste paper unit of OPA was the speaker at the meeting held at the Edgewater Beach Hotel. He pointed out the shortage in cardboard and corrugated paper as one of the biggest problems faced by the Government.

Declaring that the OPA unit must "make the public paper conscious," Mr. Grossman said that if 75 per cent of all newspapers and magazines were saved by the public for rehandling as waste, there would be no shortage of container material. "In a good many cities," Mr. Grossman said, "merchants have a habit of getting together and printing shopping guides—enlarged handbills thrown around in an effort to get cheap advertising. These guides serve no economic need because merchants can get such advertising elsewhere. If such guides can be dispensed with we can save hundreds of thousands of tons of paper."

Mr. Grossman told the envelope makers they would benefit more from a stable price level than from rising prices which "would reduce demand." He said that paper users in general now have a two month inventory on hand compared with a normal supply sufficient to last two weeks. Mr. Grossman, in addition to being a "dollar a year" man is president of the Massachusetts Envelope Company and of the Massachusetts Drinking Cup Company, both of Boston.

Coarse Paper Industry Ponders "Ceiling"

Chicago coarse paper merchants are wondering what to expect next with the OPA threat that a price schedule establishing maximum prices that jobbers and wholesalers can charge for several grades of paper, hovering over their heads. It is understood here that a meeting will soon be held to discuss the need for a schedule. At this meeting, the OPA is expected to enlarge upon their report that manufacturers are now selling kraft paper to jobbers at around 4½ cents a pound with some jobbers said to be selling as high as 8 or 9 cents a pound compared to the "ordinary resale price of around 5 to 5¼ cents." This procedure has been called "pure extortion and profiteering" and buyers have been publicly urged to refuse to pay prices of this kind.

Paper Sampler Lists New Lines

The Chicago Paper Company has recently issued a "Paper Sampler" showing some of the new or unusual papers currently carried in its large and representative stock. Current samples are of Strathmore Text, 25 x 38-70# Blue Laid and the mailing includes one of the attractive blotter series, this one describing the finishing room where paper is trimmed, counted and packed. The photograph is through courtesy of the Hammermill Paper Company and the blotter is on Albemarle Blotting: 19x24-140-White.

To Distribute "Levelcoat" Line

The new Levelcoat printing papers manufactured by the Kimberly-Clark Corporation are now being distributed in the Chicago area by the Chicago Paper Company and the Berkshire Papers, Inc. The Levelcoat line includes Trufect, Multifect and Kimfect and the Hyfect E. F. grade. The Midland Paper Company division of the Zellerbach Paper Company will continue to handle these and other Kimberly-Clark products in this area, the additions indicative of further expansion in this market.

Now Keller-Dorian Corp.

The Keller-Dorian Paper Company Inc., 516 West 34th street New York has changed its name to Keller-Dorian Corporation effective November 1. Personnel, managing and executive remains exactly as heretofore with the exception that its sales policy will embrace two divisions—one to be known as Metals Division handling all types of metal surfaced and substitute metal surfaced papers in plain, colored and embossed patterns. The Papers Division comprising the other portion of the sales change will carry an extended line of decorative coated papers in plain and embossed patterns in printed and tipped presentations together with a more expansive line of velour paperstocks obtainable in various weight backings and also the regular wood-grain types. New items are being added to the line known as Plastek presenting a durable and attractive finished paper in unique patterns and color combinations.

Both departments' sales policies will be augmented with handsome, complete and very attractive sample books. Inquiries on new patterns together with samples can be obtained upon request as soon as these are finished for general distribution.

Three Groups Angling For Lake Sulphite Co.

While Brompton Pulp & Paper Co. Has Authority To Negotiate For Purchase of Lake Sulphite Plant Two Other Groups Are Reported Interested — Quebec Lumberjacks In U. S. — Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 17, 1941—Although the Brompton Pulp and Paper Company now has the authority of a shareholders' meeting to be an active negotiator for the purchase of the properties of the Lake Sulphite Pulp Company of Red Rock, Ont., the Montreal Financial Times reports that the two other groups that have been angling for the property are both willing to offer more than Brompton appears disposed to bid. It adds: "In some quarters it is held that, if the rival groups can complete their plans satisfactorily, they stand a better chance of getting the Lake Sulphite property than Brompton.

"Meanwhile, there have been rumors that legal action may develop to impede the Brompton negotiations. At the St. Lawrence Corp. meeting, there was a hint by a stockholder of Brompton that such a development was possible."

Touching editorially on the subject, the same paper draws some moral from the shareholders' meeting above referred to. It says, in part: "There have been several instances lately that indicate that the 'small' or 'outside' security holders are more vigilant in protection of their interests than they used to be, to the point, in fact, where any new policy proposed by 'management,' or by larger security holders, is no longer accepted without question, no matter how high the standing of the interests sponsoring new policies. . . . In the case of the Brompton proposal to purchase Lake Sulphite, smaller security holders not only attended the special meeting, called to approve the deal, but voiced their opinions in no uncertain terms. To appreciate the situation, it should be pointed out that for years stockholders of St. Lawrence Corp., apparently holding every confidence in the management of the company's affairs, have been content to send in their proxies, and about the only stockholders that have attended the St. Lawrence Corp. stockholders meetings have been the directors. Such evidence of increasing vigilance, for protection of their interests, on the part of the smaller security holders, is a healthy sign, and to be commended. The stockholders are the owners of corporations, and have every right to demand information, and corporation managements are becoming increasingly aware of the importance of informing the smaller stockholders, who combined may own anywhere from 50% to 75% of the total stock, of what is being done with their money."

More Newsprint Men for National Service

Charles A. Vining, president of the Newsprint Association of Canada, has been appointed assistant to the chairman of the Wartime Prices and Trade Board, which will have the supervision of the Dominion Government's new policy placing a ceiling on prices of commodities and services in Canada. Mr. Vining was born in Winnipeg and spent three years overseas with the Canadian Armed Forces in the last war before graduating from the University of Toronto 1921. He was a member of the editorial staff of the Toronto Star and later worked in Montreal. He has been president of the Newsprint Association since 1934.

D. W. Ambridge, assistant manager of the Ontario Paper Company, Quebec North Shore Paper Company, Quebec and Ontario Transportation Company and the Baie Comeau Company, has been appointed director of the shipbuilding branch of the Department of Munitions and Supply. Mr. Ambridge is well known in the Quebec pulp and paper industry and was active in connection with the construction of the town of Baie Comeau, the starting up of the newsprint mill there and the manufacture of newsprint.

Quebec Lumberjacks in United States

Replying to complaints that Quebec woodsmen were being allowed to leave Canada for work in the United States, Prime Minister Mackenzie King stated in the House of Commons at Ottawa that over 4,400 lumbermen living in villages along the Quebec-Maine border have been permitted by United States immigration authorities to enter that country temporarily and under bond to work in the Maine woods during the next few months.

"The lumbering operations in which these men are employed," the Prime Minister stated, "are essential for the manufacture of high quality alpha pulp required by the defense industries of the United Kingdom and the United States, and a substantial part of the United States output of this product is under contract to the United Kingdom."

It was explained by Mr. King that in view of the bonded guarantees that the individuals concerned would return to Canada before March 1 next year, the United States authorities had waived the usual passport and visa requirement for this seasonal border movement.

"No question arose, therefore, of issuing Canadian passports to the individuals concerned," the Prime Minister added.

"A good proportion of the Canadian lumbermen whose temporary entry into the United States was permitted," said Premier King, "are cutting pulp wood which is floated back to Canada down the Saint John River for manufacture into alpha pulp for export to the United Kingdom."

The men taking this winter employment in Maine, added the Prime Minister, were of course all subject, within their respective age groups to the proclamations issued under the National War Service Regulations. Consideration was being given, he said in conclusion to the whole problem of border control, of which this particular movement was but one aspect.

Bay State Tissue Mills Formed

BOSTON, Mass., November 17, 1941—The Bay State Tissue Mills, Inc., Otter River, Templeton, Mass., has been incorporated to manufacture pulp and paper. There are 100 common shares of no par value. President, Milton C. Wasby; treasurer, Howard Rubin, Newton, Mass.; clerk, Francis Corbett.

Morris C. Dobrow Honored

Morris C. Dobrow, executive secretary of the Writing Paper Manufacturers Association was honored by the members at a testimonial dinner commemorating the 25th anniversary of Mr. Dobrow's connection with the association.

The dinner was held at the Waldorf-Astoria hotel on November 12. It was a complete surprise to Mr. Dobrow who has served as executive secretary of the association since 1938 upon the retirement of the late E. H. Naylor.

A. C. Gilbert, president of the Gilbert Paper Company and president of the Writing Paper Manufacturers Association presided at the informal gathering and presented Mr. Dobrow with a watch. An expression of esteem was also tendered Mr. Dobrow as follows:

MORRIS C. DOBROW

"With clearness of vision and an exacting regard for integrity you have executed the responsibilities of the high office which has been entrusted to you. Your modesty and the fine simplicity of your nature have endeared you to all of us. In recognition of your twenty-five years of devoted service this expression of esteem from the members of the Writing Paper Manufacturers Association is tendered to you."

Waste Paper Sorter Finds $185

[FROM OUR REGULAR CORRESPONDENT]

FORT EDWARD, N. Y., November 17, 1941—Several employees in the book stock preparation department were this week enriched by about $185 while working along the sorting belt. The fact that money is frequently found on the sorting belt is the main reason why mill employees prefer the dust of the sorting department to comparative cleanliness of the cutting room. The bale of waste holding the money had been in storage in one of the mill warehouses for the past few years and whether it had been placed between the leaves of a book or magazine could not be determined. Quite frequently small amounts are discovered on the sorting belt. Several years ago a quantity of counterfeit money was found but on most occasions the banknotes are genuine.

Boston Paper Trade Association Meets

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 17, 1941—Two members were elected at the fall meeting of the Boston Paper Trade Association, held November 12 at the Algonquin Club. They are B. Milton Kimball, Northern Kraft Corporation, Howland, Me., regular membership, and Ernest B. Reid, paper mill representative, limited membership.

President Robert M. Stone presided, with an attendance of approximately 125.

A nominating committee was appointed as follows: Charles S. Proctor, chairman, John E. A. Hussey, J. W. Vivian, N. L. Madden, and Matthew O. Byrne. All of these were re-appointments except Mr. Byrne, who was appointed in place of J. G. Swift, resigned.

Officers of the association are: President, Robert M. Stone; vice-president, Irving N. Esleeck; Treasurer, T. Chas. Casey; Secretary, Kilby Osborn.

Wythe Williams, commentator, who was for many years Paris correspondent of the New York Times, gave a highly interesting talk on "The World Today and Tomorrow." A question period followed the address.

Among those present at the meeting were: John W. Vivian, William Ross, George F. Morrison, Herman Miller, W. Edwin Porter, Jr., J. R. Whitney, H. C. Fowler, Norman Kimball, C. W. Harvey, C. W. Morrison, W. W. Newton, Ernest L. Reid, T. E. Pierce, J. L. Munro, George W. Wheelwright, J. H. Halloran, W. A. Dempsey, Charles W. Fields, Joseph D. Starr, Jr., F. E. Lyman, John H. Calligan, James L. Gardner, Jr., Gordon S. Butler, H. F. Ham, J. H. Sweet, Ralph L. Day, E. Sussenguth, Roger B. Vickery, Hubert W. Lockhart, C. H. Esty, F. D. Hatch, W. E. Doble, G. T. Singleton, John Shay, Paul B. Fraser, Floyd H. Blackman, Wm. C. Ross, Ralph B. Case, John Kelly, Richard F. Piper, William F. Mann, Royal P. Teele, W. Gardner Very, Charles S. Proctor, Horace S. Proctor, H. C. Thayer, S. Bartlett, Ralph G. Beckett, T. K. Davis, W. S. Smock, John E. Roach, Sumner B. Andrew, R. O'Neill, Wm. P. Watt, Louis T. Stevenson, J. R. Cryan, Wm. Walpole, David P. Abercrombie, Jr., Edgar P. Hay, Harold Hinckley, Arthur W. Frank, James J. Dwyer, Edward Stone, Lloyd W. Vibberts, E. Hay, Arthur L. Hobson, D. Cheever, Jr., Jack Mathers, Harold Bourque, M. L. Simpson, E. P. Clausmeyer, Hartley A. Hurlbert, Frank B. Cummings, E. Lindsey Cummings, Fred B. Korbel, E. H. Little, L. M. Poore, Maurice A. Park, H. M. Donahue, John G. Clark, W. H. Andrew, Bert Chase, John Bourlay, T. K. Davis, K. H. Ways, Constant Southworth, C. E. Rice, Adna C. Denison, E. C. Calkin, C. W. Townsend, C. W. Nelson, Arthur F. Fay, Herbert A. Lindenberg, Earl S. Clark, H. R. Woodward, W. P. Simonds, N. J. Patterson, M. D. Gibson, Wm. S. Collins, Clifford H. Harris, Charles J. O'Brien, Thomas A. Mitchell, Guy S. Chase, Carl Knutson, T. H. Masselink, F. G. Lockwood, J. C. Hankey, J. R. Halkyard, John A. Andrew, N. H. Winter, Lee H. Hulett, H. A. Stone, Jr., W. J. McLellan, Fred Herbolzeimer, Carl M. Fellows, Ray J. Allen, F. H. Merrill, John E. A. Hussey, R. M. Stone, Kilby Osborn, Wythe Williams, and T. Chas. Casey.

General Jackson didn't know the war was over!

Messages traveled slowly in 1815 . . . the Battle of New Orleans was fought *fifteen days after peace had been signed!* History couldn't wait for communications to catch up.

But today's communications *speed up history.* To help keep the Defense Program in high gear, teletypewritten messages criss-cross the country . . . speeding the construction of new plants, routing materials, directing production of vital military supplies, bringing up-to-the-minute news to all America by newspaper and radio.

Developed to serve business in time of peace, the teletype is proving its worth to the *whole nation* in this present emergency.

AN OLD ENGRAVING FROM THE BOOK, "LIVES OF THE PRESIDENTS"

BELL SYSTEM TELETYPEWRITER SERVICE

American Pulp Export Corp. Formed

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 19, 1941—The American Pulp Export Corporation has filed papers with the Federal Trade Commission, under the Export Trade Act (Webb-Pomerene law) for the purpose of exporting wood pulp and related products. The corporation will maintain offices at 206 North Virginia street, Reno, Nev.

Officers are: J. D. Zellerbach, chairman of the board and director; Ossian Anderson, president and director; W. A. Starr, vice president and director; E. Mills, Roy K. Ferguson and Robert B. Wolf, directors; and Julien R. Bauer, assistant secretary. Members are: Crown Zellerbach Corporation, Rayonier Incorporated, and Soundview Pulp Company, San Francisco; Puget Sound Pulp and Timber Company, Bellingham, Wash; Weyerhaeuser Timber Company, Longview, Wash.; and St. Regis Paper Company, New York.

The Export Trade Act provides that nothing contained in the Sherman Act shall be construed as declaring to be illegal a combination or "association" entered into for the sole purpose of engaging in export trade and actually engaged solely in such export trade, provided there be no restraint of trade within the United States, or restraint of the export trade of any domestic competitor; and with the further prohibition of any agreement, understanding, conspiracy or act which shall artificially or intentionally enhance or depress prices within the United States, substantially lessen competition or otherwise restrain trade therein.

Buy Paper Under Walsh-Healey Act

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 19, 1941—During the week ended November 1, the government purchased $972,197.92 worth of paper under the Walsh-Healey act, with the following orders:

$17,221.60 worth of mimeo paper for GPO from Marquette Paper Company; $27,623 worth of mimeo paper for War QMC, Ind., from Paper Corporation of U. S.; $11,520 worth of paper cups for Panama Canal from Whitaker Paper Company; $35,600 worth of mimeo paper for War Air Corps from Walker-Goulard-Plehn Company; $22,318.14 worth of paper from Mathers-Lamm Paper Company; $16,480 worth of manifold paper from Cauthorne Paper Company; $198,546.75 worth of paper from Paper Corporation of U. S.; $487,467.30 worth of paper from R. P. Andrews Paper Company; $27,200 worth of book paper from R. P. Andrews Paper Company; $18,619.93 worth of bond paper from Walker Goulard Plehn Company, all above orders for GPO; $37,236.10 worth of bond paper for War QMC Ind., from Cincinnati Cordage and Paper Company; $72,365.10 worth of filter material for War CWS Boston, from Brown Company.

May Stop Pulpwood Cutting

Cutting of pulpwood timber in Michigan's Porcupine Mountains area on the south shore of Lake Superior will be stopped if bills now in Congress succeed of passage. The proposal is to place the area under the jurisdiction of the U. S. Forest Service. The area is 250 miles square.

10,000 Pupils to Collect Waste Paper

KALAMAZOO, Mich., November 10, 1941 — Kalamazoo public school children are expected to rally a force about 10,000 strong in collecting waste paper to help overcome the shortage threatening operation of the local paper mills, according to plans soon to be formulated. Superintendent of Schools Loy Norrix received school board approval last week to devise such a program. Norrix said he planned to develop the program along lines advised by Miss Katharine Swift, Woodward school teacher who spent the first year of the war as an exchange teacher in England.

Miss Swift as an exchange teacher in Minehead, Summerset County, England, was in a community where school children collected waste paper to overcome a shortage there. The program followed there, and which is expected to be a pattern for Kalamazoo, centered in a concentrated effort in a periodic and organized paper collection campaign.

Plans for participation by the local school children followed reports from Kalamazoo paper mill executives that increasing shortage of waste paper eventually may lead to a curtailment of production and the operation of factories on a day-to-day basis.

Paper collected by the Kalamazoo school children, according to tentative plans, would be sold to dealers here and would be made available through the regular channels. Money from the sale would be placed in the various school funds for designated purposes of their own choosing.

Richard G. Staebler, member of the school board and president of the Kalamazoo Paper Box Company, emphasized the need for all sorts of waste paper, such as old bags and paper towels, in addition to newspapers and magazines which usually make up the collection.

B. C. Paper Industry to Equal Record

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 12, 1941—The British Columbia pulp and paper industry is expected to again equal the record production of 1940, during the present year.

Figures from official sources here indicate that the industry in Canada is operating at about 90 percent capacity. Elimination of Scandinavian competition and the keen demand from the United States markets have, in addition to the strong domestic demand, been inducements for expansion of existing plants, although uncertainty of future conditions has discouraged entry of new companies into production.

In 1940 the Canadian industry produced 262,144 tons of newsprint, 68,428 tons of other paper and 123,000 tons of raw pulp, shipped in that form.

Father of W. E. Smiddy Dead

W. E. Smiddy, Sr., passed away at his home, 310 Lake street, St. Albans, Vt., on Sunday, November 16, 1941. He was the father of W. E. Smiddy, Jr., New York salesman for the Missisquoi Corporation. Mr. Smiddy, Sr., had been ill with a heart ailment. He had been connected with the St. Albans' Messenger, a daily newspaper, for many years and was a native of St. Albans, Vermont. Besides his son, he is survived by his wife and a daughter, Mrs. Murray, of St. Albans, Vt.

Preference for Paper Containers

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 19, 1941—In a move to facilitate the operations of the cooperage and wooden container industries, and also to lend assistance to the production of paperboard containers, the Priorities Division today issued Preference Rating Order P-79, extending to manufacturers in these fields priority assistance in obtaining the necessary hardware, including wire and nails, saws, knives, and other tools.

Makers of all types of wooden barrels and kegs, and containers made from sawed lumber, veneer or plywood, and of paperboard containers, are included within the terms of the new order, which becomes effective today. It is believed that this assistance will greatly stimulate the substitution of these forms of packages for metal containers, and effect a considerable saving in the amounts of critical materials currently consumed in packaging.

A rating of A-5 is assigned to the deliveries of ferrous material, defined in the order as "any products made principally from iron or steel," except wire, to delivery of which an A-8 rating is applicable.

A producer, to apply the preference rating to deliveries to him, must sign an acceptance of the order, and file it with the Priorities Division, and furnish an unsigned copy to each of his suppliers with whom he has placed a purchase order for ferrous material. The supplier, in turn, may extend the order in the same fashion to obtain material to be physically incorporated in his deliveries to his customer.

The producer, or supplier, making use of the order must endorse the following statement, "Purchase order for ferrous material, preference rating ——— pursuant to Preference Rating Order No. P-79," on the original and all copies of each purchase order.

The producer is restricted in the application of the rating to those quantities and kinds of ferrous material specifically authorized for rating by the Director of Priorities on PD-82, and for the purposes authorized by the order.

Copies of the order and the necessary forms, together with instructions for mailing applications for assistance, will be mailed to some 3,000 manufacturers of wooden containers.

Hinde & Dauch Refunds Bonds

TORONTO, Ont., November 17, 1941—Hinde & Dauch Paper Company, of Canada, Ltd., has refunded its outstanding 4% first mortgage bonds, due May 1, 1941-42, of which $450,000 were outstanding Dec. 31, 1940. Replacing this retired issue is a new 3% issue of $300,000 first mortgage bonds due serially in amounts of $100,000 each on May 1, 1942, 1943 and 1944. The first mortgage bonds of Hinde & Dauch are understood to be privately held.

Sorg Paper Co. Increases Wages

MIDDLETOWN, Ohio, Nov. 17, 1941—The Sorg Paper Company, on Monday, November 10, announced that effective at 8:00 A.M. of that day all hourly wage rates for male employees would be increased six cents per hour and for all female employees, four cents per hour.

INDUSTRIAL DEPARTMENT ★ SEABOARD AIR LINE RAILWAY
SHORT CUT to FACTS
Everyone knows the South possesses outstanding advantages for manufacturing. However, not all communities in the South offer equal advantages to industry. In the six Southeastern States served by the Seaboard, as elsewhere, a plant location is good or bad depending upon whether it meets the requirements of the enterprise.
WE KNOW THE GOOD PLANT LOCATIONS
For many years we have made a careful study of this territory, and accumulated a great amount of information on plant sites, natural resources and manufacturing conditions. To responsible clients we offer an experienced and competent plant location service without cost or obligation.
Ask us for detailed studies of suitable locations for your business in the Seaboard "Profit Zone".
Address Warren T. White, General Industrial Agent, Seaboard Air Line Railway, Norfolk, Virginia.
SITES
LABOR
TRANSPORTATION
RAW MATERIALS
POWER
LIVING CONDITIONS
CLIMATE
TAXES
FREE!
INDUSTRIAL DEPARTMENT
SEABOARD
AIR LINE RAILWAY

CONSTRUCTION NEWS

Shortsville, N. Y.—The Grand Bag and Paper Company, manufacturer of tissue, crepe and other paper stocks, has plans under way for expansion and improvements in power plant at mill, with installation of additional equipment for increased capacity. Cost reported over $45,000, with equipment. Proposed to begin work soon.

Montville, Conn.—The Robert Gair Company, 155 East 44th street, New York, N. Y., manufacturer of corrugated and other boxes and containers, has work under way on installation of machinery and equipment in box-manufacturing department at its local No. 2 mill, and it is expected to begin operations in this division at early date. Company has recently resumed production in the paper-manufacturing division at same mill, and will develop capacity output at early date.

Ashtabula, Ohio—The Iten Fibre Company, Ashtabula, manufacturer of fiber products of various kinds, plans immediate rebuilding of portion of mill recently damaged by fire. Loss reported close to $10,000.

Templeton, Mass.—The Bay State Tissue Mills, Inc., recently organized, plans operation of mill at Otter River, Templeton, for the manufacture of a line of tissue papers. Milton C. Wasby is president; and Howard Rubin, 26 Tarleton road, Newton, Mass., treasurer.

Palmyra, Mich.—The Simplex Paper Corporation, Adrian, Mich., manufacturer of building papers, chipboard, straw board, insulating papers, etc., is pushing work to completion on expansion at branch mill at Palmyra, for large increased capacity in paper-making division, previously referred to in these columns, and proposes to have the facilities ready for service at early date, when a capacity schedule will be arranged.

Darlington, S. C.—The Individual Drinking Cup Company, 24th street and Dixie avenue, Easton, Pa., manufacturer of paper cups and kindred paper goods, has approved plans for new one-story factory branch, storage and distributing plant at Darlington. Erection contract has been awarded to C. M. Guest & Sons, Anderson, S. C., and work is scheduled to begin at once. Cost reported over $35,000, with equipment. Company has work in progress on one-story addition to mill at Easton, as previously noted in these columns, reported to cost approximately $80,000, with equipment. New unit will provide for considerable increased capacity. Company is affiliated with the Dixie-Vortex Company, 421 North Western avenue, Chicago, Ill.

Los Angeles, Cal.—Fire recently damaged a portion of storage and distributing plant of the Walter Schulken Paper Stock Company, 2501 East 25th street, commercial paper products, with loss reported close to $60,000. It is planned to rebuild at early date.

Knowlton, Wis.—The Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., has awarded contract to Wisconsin Bridge and Iron Company, Milwaukee, for structural steel for new power dam and power house at Knowlton, previously referred to in these columns, and work on project is now in progress. Another award for concrete reinforcing steel has been made to the Cook & Brown Lime Company, Oshkosh, Wis. Entire project will cost about $1,500,000, including generating station. Completion is scheduled in 1942.

Tacoma, Wash.—The Standard Carton Company, 2611 Pacific avenue, manufacturer of folding paper boxes and containers for food products and kindred service, has awarded general contract to Cal J. Kirk, 2114 North Prospect street, for rebuilding portion of plant recently destroyed by fire, and work is being placed under way. The fire loss was reported at close to $75,000, including building, equipment and finished stock.

Meridian, Miss.—The Flintkote Company, 30 Rockefeller Plaza, New York, N. Y., manufacturer of roofing and building papers, fiber insulation board, etc., has concluded arrangements for purchase of tract of about 75,000 acres of timberland in vicinity of mill at Meridian, for pulpwood supply for that plant, which is given over to the production of wood fiber insulation board. Company is said to be arranging for operations on a portion of the tract, with sawmill and other production facilities. This purchase will provide the company with timberland holdings to furnish about 60 per cent of the pulp wood requirements for the mill, the remaining 40 per cent being purchased from outside sources. The Meridian mill is on a capacity production schedule, with about one-half of current output for Federal account for insulation board for Army camps. The plant is several weeks behind on deliveries, and will be maintained on present production schedule for an indefinite period.

East Walpole, Mass.—Fire recently damaged a portion of building No. 5 at plant Bird & Son, Inc., East Walpole, manufacturer of roofing and building papers, wall board and kindred paper products. An official estimate of loss has not been announced, but is reported as small. The damage will be replaced. As recently noted in these columns, company has plans for new addition to branch mill at Phillipsdale, R. I., to be one-story, 150 x 360 feet, with cost reported over $75,000, with equipment; it will be used in part for dryer department and other mechanical service, storage and distribution. Work is scheduled to begin soon.

Manchester, Conn.—The main building at local mill of the Rogers Paper Manufacturing Company, 200 Charter Oak street, now vacant, was destroyed by fire, November 9, with loss estimated at close to $50,000.

Kingston, Ont.—Canadian Industries, Ltd., 1135 Beaver Hall Hill, Montreal, Que., has approved plans for new plant unit for production of cellophane at property at Kingston, consisting of a main one and multi-story unit and several auxiliary buildings, reported to cost close to $700,000, including equipment. General erection contract has been let to the Anglin-Norcross Company, 57 Bloor street West, Toronto, Ont., and work will be placed under way at once.

Ruling on Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 19, 1941—The Joint Congressional Committee on Printing has authorized the Public Printer to inform paper mills, jobbers or other contractors who have been supplying paper to the Government Printing Office during the past year or others who may currently be interested in submitting proposals for supplying paper, that it has been found inconsistent with the public interest to require a certificate of domestic origin and therefore that paragraph 90 of the pending proposal for the semi annual opening of paper on November 24 may be disregarded. This is a very important step because a law in effect for many years provides among other things that only such manufactured articles, materials and supplies as has been mined or produced in the United States, may be acquired for public use, unless the head of the department or independent establishment concerned shall determine such requirement would be inconsistent with public interest or the cost would be unreasonable to the government.

The printed invitations to bid of the Government Printing Office for the six months period from January 1 next contain this customary statement in accordance with law. It is that paragraph (No. 90) which is now deleted. As the paragraph stood before the Congressional Committee took action last week supplies submitting proposals on that paper would have bid with the understanding that the paper would have to be substantially produced from pulp ground in the United States. It was thought that during the existing emergency emergency the adherence to this requirement would not appear to have been in the public interest.

It is reported that the chief of the OPM Pulp and Paper Section has roughly estimated that civilian and military requirements of paper and paper products will amount to 26,000,000 tons. As the industry can produce only about 20,000,000 tons of paper (including Canadian pulp), there is, taking into consideration all demands, a potential shortage of about 6,00,000 tons or 30%. While the actual shortage in respect to any particular class of paper is uncertain, it is reported that the Government Printing Office has received during the past several months increasing evidence of a scarcity of paper. In many cases, it is reported, deliveries on orders cannot be had without considerable delay and in other cases numerous invitations to bid on open market purchases have been issued without attracting any bidders whatever.

The War Department, the next largest paper consumer in the Federal government, after the Government Printing Office, has included a provision in its specifications to the effect that paper may be purchased without regard to the country of origin. It is reported that the suggestion was made to the Joint Congressional Committee for this change in specifications by the Public Printer after conferences with OPM paper officials and it was he who asked that domestic origin might be waived.

TRADE AUTOMATIC MARK

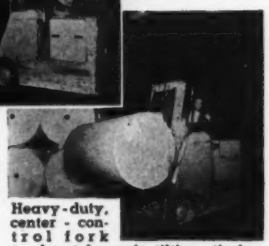
Manufacturers for Over Thirty Years

MODERN Electric Propelled INDUSTRIAL TRUCKS

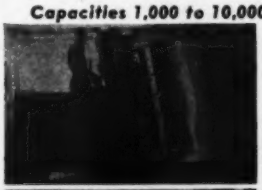
FOR ECONOMICAL MATERIALS HANDLING

- LOW AND HIGH LIFT TRUCKS
- FORK TRUCKS
- PULP AND BALE HANDLERS
- PAPER ROLL HANDLERS
- LOAD CARRIERS
- TRACTORS — CRANES

Capacities 1,000 to 10,000 Lbs.



Heavy-duty, center-control fork trucks—telescopic tilting, tiering type for low-cost roll storage and transportation. Capacities 3000 to 6000 lbs.



☆ Center-Control 3000 to 6000 lb. capacity motorized revolving paper roll handlers.

☆ Center-Control 6000 to 7000 lb. capacity heavy-duty, motorized revolving paper roll handlers.

☆ Box-car bale and roll unloader for single tier storage. 1500 to 2500 lbs.

☆ Box-cars can be loaded and unloaded in record time — with motorized roll upender. Capacities up to 3000 lbs.

☆ Chisel type pulp handlers for box-car loading, unloading and stacking.

☆ 6000 lb. capacity low-lift and high-lift trucks for skid transportation of small rolls and flat stock.

WHEN YOU BUY TRUCKS · · Buy AUTOMATIC

AUTOMATIC TRANSPORTATION CO.

65 W. 87th St. Div. of the Yale & Towne Mfg. Co. CHICAGO, ILL.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending November 19, 1941

	High	Low	Last
A. P. W.	1⅝	1½	1½
Armstrong Cork Co.	25⅝	23¼	24¾
Celotex Corp.	7½	6⅞	7¼
Celotex Corp., pf.	68	66½	68
Certain-Teed Products Corp.	2¾	2⅝	2⅝
Certain-Teed Products Corp., pf.	30½	29	30½
Champion Paper & Fibre Co.	19	17⅞	18⅜
Champion Paper & Fibre Co., pf.	....	....	....
Congoleum-Nairn Co.	15½	14⅝	15⅜
Container Corp. of America	13⅜	13⅛	13⅜
Continental Diamond Fibre Co.	9	8⅝	8⅝
Crown-Zellerbach Co.	12½	12	12⅜
Crown-Zellerbach Co., pf.	89½	88¼	88¼
Flintkote Co.	11⅞	11	11⅝
Robert Gair	2¼	2⅛	2¼
Robert Gair, pf.	11⅛	11	11⅛
International Paper & Power	16¾	15⅝	16⅝
International Paper & Power, pf.	59	57½	58¼
Johns-Manville Corp.	59½	54½	58¾
Johns-Manville Corp., pf.	125½	125	125½
Kimberly Clark Corp.	29½	28⅞	29½
MacAndrews & Forbes	23	21	21
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	25½	25¼	25⅜
Mead Corp.	7¼	6⅝	6⅝
Mead Corp., pf.	....	....	....
Paraffine Companies, Inc.	26¾	25	25
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	12⅝	11¾	11¾
Rayonier, Inc., pf.	26⅞	25¾	25¾
Ruberoid Co.	20	18¾	19⅝
Scott Paper Co.	36½	36	36
Scott Paper Co., pf.	115	115	115
Sutherland Paper Co.	17⅝	17⅛	17⅛
Union Bag & Paper Corp.	9⅛	8⅞	9
United Paperboard Co.	....	....	....
U. S. Gypsum Co.	50½	46½	49¾
U. S. Gypsum Co., pf.	175¼	175¼	175¼
West Virginia Pulp & Paper Co.	18	17⅞	17⅞

New York Curb Exchange

High, Low and Last for Week Ending November 19, 1941

	High	Low	Last
American Box Board Co.	....	....	....
Brown Co., pf.	23	22¼	22¼
Great Northern Paper	38	36¼	36⅞
Hummel-Ross Fibre Corp.	5½	5½	5½
National Container Corp.	11	10⅜	10⅝
St. Regis Paper Co.	2⅛	1⅞	2
St. Regis Paper Co., pf.	121	113	121
Taggart Corp.	2½	2⅛	2½

National Container Nets $2.49

Net profit after all charges including Federal normal and excess profits taxes totaled $822,034.99 for the first three quarters of 1941 equal to $2.49 per share compared with $707,041.95 (adjusted) for the first three quarters of 1940 equal to $2.14 per share on 330,482 shares of common stock outstanding.

Net profit after all charges, including Federal normal and excess profits taxes, amounted to $366,485.82 for the third quarter of 1941, equal to $1.11 per share compared with $229,170.33 (adjusted) for the third quarter of 1940 equal to $.69 per share.

Combined net sales of National Container Corporation and its subsidiaries for the period January 1 to September 30, 1941, were $7,305,304.56 compared with $5,697,629.64 for similar period in 1940.

Lily-Tulip Cup Nets $3.62

The Lily-Tulip Cup Corporation and subsidiaries for the twelve months to September 30, reports a net profit after $383,822 provision for Federal excess profits tax and $304,066 for normal and surtax, $686,318, equal to $3.62 each on 189,539 common shares. This compares with net profit of $595,878, or $3.14 a share, for twelve months to September 30, 1940, when Federal excess profits tax was $62,052 and normal income taxes totaled $183,789.

International Nets $4,751,007

The statement of consolidated profit and loss for the quarter September 30 of the International Paper Company shows a net profit of $4,751,007.85 as compared with $5,315,118.44 for the same quarter of 1940. This compares with a net profit of $3,214,688.38 for the three months ended June 30, 1941.

The consolidated profit and loss statement follows:

STATEMENT OF PROFIT AND LOSS

(International Paper and Power Company was terminated October 4, 1941 and the assets and operations formerly controlled by it are now owned or controlled by the new International Paper Company.)

	Three Months Ended Sept. 30, 1941	Three Months Ended Sept. 30, 1940
Sales and Other Income:		
Gross sales, less returns, allowances and discounts	$57,921,237.01	$42,223,316.23
Other income—net	838,642.12	723,650.33
	$58,759,879.13	$42,946,966.56
Cost and Expenses:		
Cost of sales:		
Pulpwood, labor, materials, etc.	$29,884,300.09	$21,337,751.50
Maintenance and repairs	3,188,242.20	2,574,754.36
Taxes (other than income taxes)	1,120,916.27	814,921.76
Outward freight and delivery expenses	7,076,776.36	5,966,993.26
Selling, general and administrative expenses	1,935,848.03	1,694,272.04
Provision for doubtful accounts	171,928.35	151,565.97
	43,378,011.30	32,540,258.89
	$15,381,867.83	$10,406,707.67
Deductions:		
Interest on funded debt	$ 734,925.95	$ 733,579.16
Interest on other debt	2,660.50	1,918.57
Amortization of debt discount and and expense	62,913.24	87,616.74
Depreciation and obsolescence	2,714,626.80	1,801,609.94
Depletion	267,021.18	250,759.91
Dividends paid on stock of subsidiary	3,398.00	—
Dividends accrued but not being currently paid on preferred stocks of subsidiaries	10,995.24	14,943.75
	3,796,540.91	2,890,428.07
Net Profit before taxes based on income	$11,585,326.92	$ 7,516,279.60
Less taxes based on income:		
U. S. Federal taxes:		
Normal	$ 1,313,064.46	$ 1,299,741.00
Excess profits	4,812,984.00	476,458.00
State taxes	334,197.00	166,535.00
Canadian and other foreign taxes	803,191.53	1,635,892.07
	7,263,436.99	3,578,626.07
Net profit before adjustment of reserve for additional taxes	$ 4,321,889.93	$ 3,937,653.53
Add: Excess provision for taxes during six months ended June 30, 1941-1940	429,117.92	1,377,464.91
Net profit	$ 4,751,007.85	$ 5,315,118.44

At September 30, 1941, the undeclared cumulative dividends on the outstanding Cumulative Convertible 5% Preferred Stock amounted to $5.00 per share or a total of $4,629,830.00.

The above statements are subject to audit and final adjustment at December 31st (end of fiscal year).

U. S. Gypsum Votes Dividend

Directors of the United States Gypsum Company have declared dividends of $1.50 a share on the common stock, payable on December 24, as well as the regular quarterly dividend of 50 cents a share, payable on December 31. Payments for 1941 will total $3.50, the same as last year.

Hammermill Orders Dividend

The Hammermill Paper Company has ordered a 50-cent dividend. Previously this year 25 cents each was paid in September, June and March.

Paper Supply Adequate

In discussing the paper situation, Leon Henderson, Price Administrator, speaking at a joint meeting of the Association of National Advertisers and the American Association of Advertising Agencies, at Hot Springs, Va., on November 13, said that supplies of newsprint and book paper appear adequate for the next year. He reported, however, that hoarding by some users was extensive. His office does not propose to sanction any price increases as long as costs and profits remain at their present satisfactory level.

He also revealed that in the paper and paper products section of the price division, a separate printing paper unit is being established, which will scrutinize closely all current prices of printing paper. A distributors' unit is also being organized and he urged publishers and printers to register complaints with the OPA on further price increases in the field.

Mr. Henderson obviously felt that in listing him with other anti-advertising elements, the advertising profession had built up a "straw man," and he asked that his denial be accepted in good faith. He assured the advertising profession that it faced no peril not shared by other economic and social organisms in the country and urged his audience to submerge its differences with the government for a common union against their greatest enemy, Hitler.

The Price Administrator summarized his attitude toward advertising as follows:

1. Advertising is the cheapest and most efficient method of selling goods and if we are to have an expanded economy there should be more of the right kind of advertising.

2. Advertising, the total of which equals only 2 per cent of the value of all manufactured goods, has not even been considered as a major cost element in the fixing of price ceilings.

Mr. Henderson saw no necessity for curtailing of advertising, as the market for consumer goods, which do not conflict with national defense, has not yet reached its limit. He cited cotton, for instance, the consumption of which has risen from 8,000,000 to 11,000,000 bales in the last year.

"The question of advertising expenditures as I see it," he declared, "is a matter resting exclusively within the control of the advertiser. The Office of Price Administration has no official policy on this question and does not intend to have one, except that we will decline to make any decision or recommendation as to the extent of advertising expenditures."

In closing Mr. Henderson predicted an even greater use of advertising when peace comes.

APPLETON JORDANS

■ When you buy a jordan today you want every assurance of dependable, trouble-free operation. That is the kind of paper making equipment Appleton Jordans have always been. They are precision built for smooth performance and to allow close control of the refining process. They are sturdy, maintain original efficiencies and guarantee dependable, low cost operation under severe service conditions. There is an Appleton Jordan for your refining needs, a size for your stock and production requirements, with fillings to fit the job.

APPLETON JORDAN

THE APPLETON MACHINE COMPANY

APPLETON • WISCONSIN

To Manage Cellophane Plant

Charles W. Nulse has been appointed superintendent at the Cellophane Division mill of E. I. du Pont deNemours & Co., Inc., at Tonawanda, N. Y., succeeding A. T. Twing, who has been appointed manager for an ordnance plant of the Remington Arms Company, a subsidiary interest, at Denver, Col. Mr. Nulse has been assistant to Mr. Twing for the past 18 months.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 113 November 20, 1941 No. 21

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

INFLATION AND TAXES

Some tax experts have estimated a national debt of at least $100,000,000,000 in 1944. A substantial part of government spending is for national defense but the lend-lease program, in which the United States is undertaking to aid all nations struggling against aggression, is also rapidly increasing the national debt. As the national debt mounts the danger of inflation grows. Piece-meal government control is not considered adequate. Secretary Morgenthau has suggested a "withholding" tax of 15% to apply to individual incomes in 1942. Other experts, however, assert the Treasury's plan would do little to curb inflation, because some 40,000,000 workers would not be required to pay a regular tax or would be taxed at the lowest rates.

It has been pointed out that under the present tax law, a relatively few taxpayers are required to pay increased taxes, while farmers and wage earners who are now receiving the bulk of income increases are subject to little or no tax increases. Although blanket price control has been advocated as the most effective means for controlling inflation, Congress is apparently not disposed to consider direct price controls, neither will it be likely to discuss "withholding" or any other higher taxes for many months.

The people of the United States were brought one step closer to the point where they must actually assume the direct and immediate financial burden of the defense program when the new revenue law was enacted last month, states the Guaranty Trust Company of New York in discussing taxes and the financial outlook in the current issue of *The Guaranty Survey*, its monthly review. "The country is now confronted with the heaviest tax load in its history, yet one that falls far short of measuring the current cost of rearmament. In view of the fact that the unprecedented tax burden imposed by the new revenue act will come far short of meeting our Government's financial requirements, the need for substantial curtailment in non-defense costs is particularly urgent. The law itself contains a recognition of this need; a committee is established to survey the whole field of Federal expenditure with a view to recommending the elimination or reduction of all non-essential spending. Thus apparent in the legislation is a promise that, supplementing the sound and conservative tax policy that it embodies, there will be a reduction of unnecessary portions of the taxpayers' load."

Continuing the discussion of the need for non-defense economies, the *Guaranty Survey* says in part that, "The compelling requirements of the present emergency do not alter the fact that non-defense spending represents the main unsolved problem of public finance in United States. Emergency deficits can be faced with relative complacency, since they are essentially temporary. But it must not be forgotten that the defense program is only a year old, whereas the Federal budget has not been balanced for eleven years. Whatever may be the peak sums that taxation will have to furnish during the current war period, effective resistance to unwarranted demands of pressure groups will remain a major necessity. Group subsidies, supposedly temporary, threaten to become permanent. In the face of the largest employment in the country's history, the Government is still carrying a heavy burden of relief. At a time when agricultural income is at the highest level in many years, higher farm subsidies are being granted. A social security burden has already been assumed that will make incalculable financial drains in future years, but further broad extensions of the system are being planned. Such tendencies, if uncurbed, will perpetuate the habit of deficit financing, with its menace of ultimate financial chaos. In the struggle to defend its free institutions, the nation cannot afford to continue the fiscal laxity that constitutes one of the deadliest threats to their preservation."

In commenting on the prospect for further taxation, the *Survey* states that "The new revenue act is designed to raise the tax receipts of the Treasury to a figure never before approached. Its original objective was to lift the Government's revenue to the equivalent of two-thirds of the anticipated expenditures. The amount of additional Treasury income to be raised has been held close to the original goal; but in the meantime the scale of prospective defense costs has risen, with the result, it now appears, that the higher taxes will cover a somewhat smaller portion, perhaps one-half, of the expected outlay during this fiscal year. The currently indicated total, Federal, State and local taxes is equal to approximately a fourth of the estimated national income. With defense costs rapidly mounting and their peak not yet

foreseeable, the maintenance of a ratio of taxation to Treasury borrowings approximating the two-to-one standard is expected to necessitate even higher taxes in the near future. And the wide public approval of the policy reflected in the unprecedented tax burden now assumed supports the belief that some such conservative relation of taxes to expenditures can be continued as an acceptable yard stick for fiscal guidance in future phases of the emergency."

Pointing out that danger exists in frequent changes in the tax system, the *Survey* declares that, "There is a limit to the tax burden that the national economy can support, even in an emergency, without loss of operating efficiency. This limit may not yet have been reached; it is to be hoped that it has not. But a radically revised set of tax rates should be left in effect long enough to permit at least some observation of its effects before being superseded by another. And it is well known that uncertainty regarding the conditions under which business operations must be carried on in the near-term future can be a serious drag on industrial planning and productivity."

D. W. Ambridge Made Director

D. W. Ambridge, assistant manager of Ontario Paper Company and associate firms, has been appointed director of the shipbuilding branch of the Department of Munitions and Supply of Canada.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1941		Corresponding Weeks, 1940	
October 4	103.4	October 5	85.4
October 11	103.1	October 12	86.2
October 18	104.9	October 19	84.5
October 25	107.5	October 26	85.9
November 1	109.7	November 2	85.6
November 8...(Prelim.)	*104.0*	November 9	85.6

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1940	89.1	84.7	82.3	84.3	90.0	92.1	85.3
1941	85.6	89.7	92.2	96.4	98.9	99.5	94.8

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1940	85.1	81.5	85.5	84.9	80.9	85.6
1941	101.8	99.6	*105.4*	...	...	...

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941
Year to Date..	69.5	79.5	83.7	71.1	82.0	86.1	*96.5*
Year Average.	69.9	80.4	79.8	71.5	83.4	85.6	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	62	67	67	70	69	70	69	75	78	82	80	74	72
1937	80	86	86	88	85	77	66	74	69	65	55	45	73
1938	54	60	61	57	58	56	57	66	66	70	65	59	61
1939	60	67	71	69	64	67	63	72	74	84	81	71	70
1940	71	70	69	70	76	79	72	74	72	79	77	71	73
1941	75	81	82	83	84	88	86	94	94	99	..	..	..

Week ending Oct. 4, 1941—100
Week ending Oct. 11, 1941— 99
Week ending Oct. 18, 1941— 98
Week ending Oct. 25, 1941—100
Week ending Nov. 1, 1941— 99
Week ending Nov. 8, 1941— 97

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

EXPORTERS
OF AMERICAN PULP

TO
BRITAIN
SOUTH AMERICA
AND ALL WORLD MARKETS

LYDDON
& COMPANY
(AMERICA) INC.

51 EAST 42ND STREET
NEW YORK CITY

EXCELLENT ADVICE, Mr. Tigwell!

Roll Grinding *

A special word on roll grinding would not be amiss here. Several mills are giving their rolls the benefit of scheduled grinding with excellent results. A gravel road, scraped regularly, will not take on that washboard surface. A roll ground regularly will provide a good surface for the sheet of paper, giving it a higher finish; will give more even drying conditions, longer felt life, longer wire life, and better operating conditions. Barring accident, roll surfaces go bad on schedule. Thus a grinding program can be worked out to insure good roll conditions by grinding them in time. Furthermore, the grinder will operate much more steadily and satisfactorily.

Maintenance should receive an increasing amount of serious thought by management. We must take good care of our machinery today as it is going to be hard to replace for a long time to come.

Every paper mill should give the most careful consideration to Mr. Tigwell's suggestion. With the problem of shortages affecting nearly all materials (including rubber) it is imperative to obtain the greatest possible life from existing mill equipment.

To help you establish a practical policy of roll maintenance, we will gladly supply complete information on the best methods of storing, handling, grinding and operating rubber covered rolls. Send for bulletin on these subjects and for a supply of roll service record sheets which make it easy to keep complete records of rubber roll specifications, grindings and service life. Furnished without charge or obligation as a Stowe-Woodward service.

* *From a paper on "Preventive Maintenance for the Paper Machine", presented by Mr. P. H. Tigwell of Beloit Iron Works at the Fall Meeting of TAPPI at Ann Arbor, Michigan.*

Stowe-Woodward

THE RUBBER ROLL SPECIALISTS

Newton Upper Falls, Mass.

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Nature of Lignin Residues in Unbleached and Partially Bleached Sulphite Pulp

By Leslie L. Larson[1]

Abstract

The residual lignin in sulphite pulps is present as a sulphonated lignin (solid lignosulphonic acid) with an average sulphur content of 4.75% for Klason and Willstätter lignin and 4.13% for methanol lignin.

On chlorination of a normal sulphite pulp, lignin appears to be the only product removed; however, for a rawer pulp, a considerable amount of carbohydrate material is removed, and the greater the percentage of chlorine used, the greater the quantity of carbohydrate material dissolved from the pulp. When chlorinated pulps are extracted with caustic, lignin is again the chief product removed, but some carbohydrate material is dissolved. For pulps with a low lignin content the ratio of the carbohydrate material removed to the lignin removed is greater than for the rawer pulps.

From 87 to 92% of the chlorine added in chlorination can be recovered in the chlorination waste liquor; from 56 to 66% of the total is found as hydrochloric acid. A part of the chlorine remaining in a chlorinated pulp is held loosely and is removed during the process of drying. The chlorine in the solids of the chlorination waste liquors is relatively stable to heat and drying.

Chlorination of pulps with 75% of the chlorine demand reduces bleachability values about one and a half times that of 35% of the chlorine demand, even though over twice the quantity of chlorine is used, indicating that a part of the chlorine is consumed by the already chlorinated lignin. Hot caustic extraction (2% at 80 deg. C.) is about 10% more effective in lowering bleachability values of chlorinated pulps than cold extractions (20 deg. C.). Chlorine is split from chlorinated lignins on treatment with caustic. The chlorine content of Klason lignins from caustic-extracted pulps is lower than that of chlorinated pulps. Chlorination of pulps splits methoxyl groups from the lignin; the greater the degree of chlorination, the greater the loss of methoxyl. Methanol lignin from chlorinated sulphite pulp indicates a replacement of one methoxyl group by a hydroxyl group in a lignin unit during the chlorination of the pulp and subsequent isolation of the lignin. Caustic extraction of the residues from chlorination waste liquors apparently has no effect on the methoxyl content, but when chlorinated pulps are extracted, the lignin with the lowest methoxyl content is removed. Alkali lignin from a chlorinated pulp indicates a loss of slightly more than one methoxyl group from the lignin unit.

The bleaching action of chlorine on pulp is due chiefly to the formation of chlorinated lignin compounds that are partly soluble in water and somewhat more soluble in sodium hydroxide. Despite the large volume of research carried out on the chlorination of pulps, investigators are not agreed as to the chemical reactions taking place in the process. The lack of knowledge concerning the structure and behavior of lignin probably accounts for the slight progress that has been made regarding the actual mechanism of the chlorination reaction in bleaching of wood pulp.

It was the purpose of this investigation to study the process of sulphite pulp chlorination in order to determine what happens chemically to the lignin. In order to carry out this study two spruce pulps were prepared and chlorinated with different percentages of the chlorine requirement. Material, chlorine, and sulphur balances were made in order to ascertain the distribution of chlorine and sulphur in the resulting products. The lignins were isolated from the pulps and from the liquors at various stages by different methods and their chemical nature was studied. Sodium hydroxide extractions were also made at different temperatures to determine their effect on the chlorinated lignins.

Two sulphite pulps with widely different lignin contents (A with 3.85 and B with 15.2%) were prepared and each was chlorinated with 35 and 75% of the chlorine demand. The four chlorinated pulps were then extracted with cold and hot 2% sodium hydroxide (at 20 and 80 deg. C.) at 10% consistency. Material, chlorine, and sulphur balances were made on the chlorination and extraction experiments. The original, the chlorinated, and the caustic-extracted pulps were analyzed for bleachability (Roe chlorine number, permanganate number, and lignin content) and for sulphur, chlorine, and methoxyl content. The lignins of these pulps, isolated by the Klason method, the chlorination waste liquors, the caustic waste

A portion of a thesis submitted in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Doctor of Philosophy from Lawrence College, Appleton, Wis., June, 1940. This work was carried out under the guidance of F. E. Brauns.

[1] Member TAPPI, Chemist, Kimberly-Clark Corporation, Kimberly, Wis.

liquors, and the solids obtained from the chlorination liquors were analyzed.

Methanol and alkali lignins were prepared from Pulp B and chlorinated with 75% of the required chlorine. These lignins were methylated, acetylated, and analyzed for methoxyl, acetyl, sulphur, and chlorine. The alkali lignin from the chlorinated pulp was made in order to determine whether new hydroxyl groups were formed by the removal of chlorine by the caustic.

The designation of the samples as used in tables, methods, and discussion is as follows:

1. A. Sulphite pulp with low lignin content (3.85%).
2. A-35 and A-75. Pulp A chlorinated with 35 and 75%, respectively, of the Roe chlorine number.
3. A-35-20 and A-75-80. Chlorinated pulps extracted with 2% caustic at 20 and 80 deg. C., respectively.
4. B. Sulphite pulp with high lignin content (15.2%).
5. B-35 and B-75. Pulp B treated like 2.
6. B-35-20 and B-75-80. Chlorinated pulps (5) treated like 3.
7. B-NaOH and B-75-NaOH. Alkali lignins from Pulp B and from chlorinated Pulp B-75(5).
8. B-MeOH I. Water-soluble, MeOH-insoluble methanol lignin from Pulp B.
9. B-MeOH II. Methanol-soluble, ether-insoluble methanol lignin from Pulp B.
10. B-75-MeOH. Methanol lignin from chlorinated Pulp B-75(5).
11. B-75-I. Lignin isolated from the aqueous methanol solution in the dehydration of moist chlorinated Pulp B-75(5).

Experimental Procedures

Preparation of the Pulps

Chips from Canadian black spruce were cooked in experimental stainless steel digesters using a calcium bisulphite liquor with 6.22% total and 1.22% combined sulphur dioxide. The total cooking time for Pulp A was 8 hours and Pulp B 6 hours. The maximum cooking temperature was 135 deg. C. In both cases the pulps were shivy and were disintegrated in a 5-pound Dilts beater with the roll five rounds above the grinding point. The screened pulp was mixed thoroughly, pressed to a 25% consistency, and stored in 5-gallon glass jars, using toluene as a preservative.

All fines and screenings were collected and weighed for yield determination (Table I).

TABLE I.—SULPHITE COOKS

	A	B
Wood cooked (moisture-free), g.	6300.0	5800.0
Screened pulp (moisture-free), g.	2921.0	3305.0
Fines and screenings (moisture-free), g.	196.0	382.0
Total yield of pulp, %	49.5	63.6

Chlorination of the Pulps

Four different chlorination experiments were carried out for the first part of the investigation. Both pulps were chlorinated with 35 and 75% of the chlorine requirement as indicated by the Roe chlorine number.

In carrying out a chlorination, 600 grams of pulp (moisture-free basis) were diluted to a 3% consistency and thoroughly mixed. Enough water was filtered off so that, after the addition of the chlorine water, the consistency was 3%.

The chlorinations were made with freshly prepared chlorine water (5.5 to 6.5 grams per liter as given by the thiosulphate-potassium iodide titration). The reactions were carried out in a 22-liter round-bottom flask fitted with a mercury seal for motor-driven stirrer and held solidly in a tub containing water at 20 ± 1 deg. C. An inlet tube that reached below the pulp surface was used for adding the chlorine water. An outlet tube passing through a sodium thiosulphate absorption flask was used to collect any chlorine gas not reacting.

The chlorine water was siphoned into the mixture which was stirred continuously. The chlorinations were taken to exhaustion of the free chlorine. The pulp was washed thoroughly with water at 20 deg.C. on a cloth-covered box until free from acid, pressed to approximately 25% consistency, and stored in an airtight container.

The data on chlorinations are recorded in Table II.

TABLE II.—CHLORINATION

Pulp	A-35	A-75	B-35	B-75
Total chlorine added, g.	12.4	26.4	41.2	88.2
Chlorine consumed	12.4	26.4	41.2	87.9
Time for adding chlorine, min.	7	16	18	30
Time for chlorine exhaustion, min.	50	80	75	240
Pulp yield (moisture-free), g.	588.6	586.1	548.5	518.1
Yield of pulp, %	98.1	97.7	91.4	86.9

Solids from Chlorination Liquors

For the isolation of the dissolved material, an aliquot part of the chlorination waste liquor was concentrated under reduced pressure (temperature not over 40 deg. C.) to a small volume and finally dried in a vacuum desiccator over calcium chloride and sodium hydroxide. The residue was pulverized in a mortar and analyzed in the same way as the lignins.

Because the lignin in the pulp was sulphonated, it was not surprising that a considerable part became soluble in water on chlorination. In order to determine the effect of alkali on the removal of chlorine from the dissolved lignin, a portion of the solid fraction was treated with sodium hydroxide under the same conditions as were used for the extraction of the chlorinated pulps. The mixture was allowed to stand for 60 minutes, made up to 250 cc. with water, neutralized with hydrochloric acid, and the lignin precipitated with benzidine.

Caustic Extraction of Chlorinated Pulps

Caustic extractions were made on each of the chlorinated pulps at 20 and 80 deg. C. for 45 minutes, the contents being stirred occasionally by hand. At the end of the reaction period, the pulps were filtered on a Büchner funnel and pressed, using a muslin cloth previously washed with 2% sodium hydroxide. The filtrates were collected for analysis.

The pulps were washed thoroughly with water at the same temperature as that used for extraction, pressed, crumpled, and stored in jars.

The conditions of extraction and data on the yields are given in Table III. The differences in consistencies and concentrations were due to changes in moisture content of some of the pulps.

TABLE III.—CAUSTIC EXTRACTION DATA

	A-35-20	A-35-80	A-75-20	A-75-80	B-35-20	B-35-80	B-75-20	B-75-80
Weight pulp used (moisture-free), g.	190	185	202	202	189	195	200	200
Total volume water, cc.	2075	2065	1950	2050	1810	1820	1800	1800
NaOH added (moisture-free fiber basis), %	2.37	2.43	2.23	2.23	2.11	2.05	2.00	2.00
Pulp yield, %	98.4	97.3	99.5	100	97.9	95.6	97.0	97.0

Preparation of Lignins

1. *Willstätter lignin.* The only Willstätter lignins prepared were from the original sulphite pulps. The crumpled pulp (25% consistency) was allowed to air dry and then run through a Gösta Hall shredder. Fifty grams of the pulp were treated with 1 liter of supersaturated hydrochloric acid (sp. g. 1.224 at 0 deg. C.) and stirred for two hours at room temperature, diluted with 325 grams of ice and kept at room temperature for 18 hours. At the end of this period

325 cc. of water were added and the mixture filtered on a Büchner funnel. The precipitate was washed with 500 cc. of dilute hydrochloric acid (1:1) and 500 cc. of water. The residue was transferred to a beaker, boiled with water, filtered, and finally washed free of chlorides.

2. *Klason lignin.* Klason lignin was prepared from the two sulphite, the four chlorinated, and the eight caustic-extracted pulps. An equivalent of about 50 grams of moisture-free pulp was allowed to dry overnight at 105 deg. C. and then treated with 1 liter of 72% sulphuric acid previously cooled to 10 deg. C. The mixture was stirred by hand for about 10 minutes in order to moisten the pulp. It was then stirred with a motor for 3.5 hours, after which 2750 grams of distilled water and ice were added. The material was centrifuged and finally filtered through a Büchner funnel. The lignin was then boiled with fresh 3% sulphuric acid for 4 hours, again centrifuged, and filtered.

The filtrate in every case was slightly cloudy; therefore, it was boiled with 2% sodium sulphate for 2 hours, centrifuged, filtered, the precipitate added to the original lignin, and the entire mass washed free of acid. In the preparations of lignin from the chlorinated Pulps B, the material could not be washed completely free of acid; the washing was continued until a pH of 4 to 5 was reached.

3. *Benzidine lignosulphonates.* The lignin in the waste liquors was precipitated with benzidine hydrochloride, using 10 cc. of the benzidine solution (40 grams per liter) for 100 cc. of the liquor. The solution was shaken, centrifuged, filtered through a Hirsch or small Büchner funnel, and finally washed free of chlorides. The material was allowed to dry in a vacuum desiccator, after which it was pulverized.

4. *Alkali lignins.* The alkali lignins from Pulp B (B-NaOH) and from its chlorinated pulp (B-75-NaOH) were prepared under the identical conditions. This was achieved by using an autoclave in which iron beakers could be placed. In this way the two cooks were carried out at the same time.

A. *Pulp B.* The cook was carried out with an equivalent of 100 grams of moisture-free pulp, 20 grams of sodium hydroxide, and 480 cc. of water. The pulp and liquor were placed in the beakers, the autoclave was partly filled with caustic liquor of the same strength, sealed, and placed in a wax bath which was heated to 180 deg. C. The temperature in the autoclave reached 160 deg. C. in 1 hour, when the pressure was relieved until steam began to exhaust. After 1 hour of heating at 160 deg. C., the autoclave was taken out of the bath, cooled, and the pulp removed. It was filtered on a Büchner funnel and the liquor collected. The pulp was then washed with a liter of water, immersed in water, and allowed to stand over the weekend. The filtered pulp was extracted with fresh water in a Soxhlet extractor until the liquid was colorless and showed no alkalinity, pressed to a 25% consistency, and stored in a jar. The yield of pulp was 70.6 grams with a Klason lignin content of 6.77%.

The filtrate and washings from the cook were concentrated under reduced pressure (50 deg. C.) in a carbon dioxide atmosphere (to prevent oxidation of the organic matter) to a final volume of about 400 cc. A slight excess of concentrated hydrochloric acid was added to the concentrated liquor whereby a part of the lignin was precipitated. The mixture was then dialyzed in a cellophane bag against running distilled water which was changed at the rate of about two liters per hour, while the mixture was stirred with a motor. At night the material was allowed to stand without stirring or water change. The water in the outside cell showed no test for chloride or sulphate after standing overnight. With the removal of the electrolytes, the lignin formed a colloidal solution. It was isolated by concentrating the solution *in vacuo* and removing the water by repeated distillation with dioxane under reduced pressure. A small dioxane-insoluble portion (0.50 gram) was centrifuged off and the lignin precipitated by dropping the dioxane solution into absolute ether with vigorous stirring. The lignin separated as a yellow powder. This was washed twice with ether and twice with petroleum ether and dried in a vacuum desiccator over sulphuric acid. The yield was 9.27 grams. For further purification, 4.27 grams were redissolved in dioxane containing a few drops of water, precipitated again with ether, and washed as described above, yielding 3.98 grams.

One gram of the purified lignin was methylated twice with diazomethane in a suspension of methyl alcohol. The methoxyl content increased from 12.91 to 17.68% and after the second methylation to 17.75%.

A sample (0.66 gram) of the lignin was dissolved in 10 cc. of pyridine and 4 drops of water and acetylated with acetic anhydride. The yield of acetylated lignin was 0.70 gram.

The results of the analyses on the original, acetylated, and methylated lignins are given in Table IV.

TABLE IV.—ANALYSES OF ALKALI AND METHANOL LIGNINS

Lignin	S %	Cl %	MeO %	AcO %	Ash %
B-NaOH	2.37	....	12.91	...	3.16
Methylated	2.18	....	17.75	...	2.23
Acetylated	2.12	....	10.31	19.5	2.04
B-75-NaOH	2.36	3.40	7.74	...	4.37
Methylated	2.47	3.11	14.57	...	4.32
Acetylated	2.63	3.95	6.18	17.0	3.82
B-MeOH-I	4.05	....	14.47	...	5.27
Methylated	3.88	....	19.72	...	5.02
Acetylated	3.74	....	11.63	15.8	5.65
B-MeOH-II	3.60	....	12.02	...	7.12
Methylated	3.49	....	14.89	...	7.19
Acetylated	3.47	....	9.95	18.2	7.03
B-75-MeOH	2.51	13.86	8.81	...	7.43
Methylated	2.19	13.62	10.27	...	7.27
Acetylated	2.51	13.40	6.58	19.6	5.12
B-75-I	2.00	22.78	3.24	...	12.12

B. *Chlorinated Pulp B.* An equivalent of 300 grams of moisture-free sulphite Pulp B at 3% consistency was treated with chlorine water (5.79 grams per liter) equivalent to 75% of the Roe chlorine requirement (44.12 grams) at 27 deg. C. to chlorine exhaustion, which required 210 minutes. The pulp was washed thoroughly with water on a cloth-covered box until free from acid, pressed to approximately 25% consistency, and stored in a jar. The yield of pulp was 257 grams or 85.8%.

One hundred grams of this chlorinated pulp were cooked at the same time and under identical conditions as Pulp B (described above). The yield of pulp was 79.1 grams with a lignin content of 2.11%. The method of purification of the lignin was the same as for Pulp B. The yield of purified light-brown lignin was only 0.82 gram as a larger part was insoluble in dioxane. This portion was dissolved in acetone containing a few drops of water. The acetone-water-insoluble residue of 0.21 gram was removed by centrifuging, and the filtered solution was poured into ether. The precipitate was washed with ether and petroleum ether, and dried as described above. The yield was 3.12 grams; of this 2.62 grams

were purified as before, yielding 2.49 grams of a dark-brown lignin (B-75-NaOH).

One gram of the material was methylated with diazomethane in a suspension in pure acetone. On the first methylation, the methoxyl content increased from 7.74 to 14.50%, and on the second to 14.57%.

A sample (0.46 gram) of the purified lignin was acetylated in pyridine, with acetic anhydride, giving 0.54 gram of acetylated lignin.

5. *Methanol Lignins.*

A. *Pulp B.* For the preparation of methanol lignin it is necessary to remove all water from the pulp, if possible without drying it. An equivalent of 100 grams of moisture pulp (25% consistency) was triturated twice with anhydrous methanol, which was then filtered off. The pulp was then placed in a Soxhlet extractor and extracted twice with absolute methanol for 12-hour intervals. Fresh methanol was then used and lime added to the flask to retain the last traces of water. This extraction was continued for another 8 hours.

The pulp thus prepared was refluxed for 12 hours in a 2-liter ground glass flask on a water bath with 800 cc. of anhydrous methanol containing 2% of anhydrous hydrogen chloride. The dark-colored alcohol solution was filtered off, the pulp transferred to a Soxhlet extractor and extracted with absolute methanol for 8 hours. The yield of extracted pulp was 93.5 grams with a lignin content of 9.52%. The lignin content before extraction was 15.16%.

The combined methanol extracts were concentrated under reduced pressure and any water present was removed by distillation with three 25-cc. portions of dioxane. The residual product was dissolved in 40 cc. of a mixture of methanol and dioxane, the lignin isolated by precipitation with dry ether, and washed as usual. The yield was 6 grams of a cream-colored lignin. The dried material could not be redissolved in methanol or dioxane but was soluble in water. A water solution was prepared and the lignin precipitated with absolute methanol (B-MeOH-I). The latter was washed twice with ether, twice with petroleum ether, and dried in a vacuum as previously described. The yield was 2.05 grams of a brown lignin having a purple cast.

A sample (1 gram) of the lignin was suspended in absolute methyl alcohol and methylated with diazomethane. On the first methylation the methoxyl content increased from 14.47 to 19.79% and did not change after a second methylation.

A sample of the original lignin (B-MeOH-I) (0.46 grams) was acetylated in pyridine with acetic anhydride, giving 0.37 grams of acetylated lignin.

The aqueous methanol mother liquor from the precipitation of B-MeOH-I was concentrated under reduced pressure, dissolved in methanol-dioxane, and precipitated with ether; the yield was 2.41 grams of a cream-colored product (B-MeOH-II).

A 1-gram sample was methylated in absolute methyl alcohol. The methoxyl content increased from 12.02 to 14.74% and then to 14.89% after remethylation.

The acetylation was carried out by dissolving 0.47 gram of the original lignin in 10 cc. of pyridine and 8 drops of water. The yield of the acetylated product was 0.44 gram.

B. *Chlorinated Pulp B-75.* An equivalent of 72.6 grams of moisture-free chlorinated pulp was given the same methanol treatments as Pulp B. The yield of pulp was 68.0 grams with a lignin content of 3.62%. The yield of a light-yellow lignin was 3.50 grams.

The dried lignin was insoluble in dioxane, methanol, and water, or any mixture of the three. Finally, 2.74 gram of the material were dissolved in acetone containing a few drops of water, precipitated by pouring into ether, and washed as previously described. The yield was 2.11 grams.

A 1-gram sample was methylated with diazomethane in a suspension of purified acetone. The methoxyl content increased from 8.81 to 9.89 and then to 10.27% on remethylation.

The acetylation was carried out by dissolving 0.46 gram of the original lignin in 10 cc. of pyridine and 4 drops of water. The yield of the acetylated product was 0.38 gram.

The water-methanol solution obtained from the dehydration of the pulp was yellow in color; it was concentrated under reduced pressure, the water removed by repeated distillation with dioxane, and the lignin precipitated by dropping it into ether (B-75-I). The product thus obtained from 65.5 grams of chlorinated pulp weighed 1.17 grams and was cream colored. The analyses of this product are given in Table IV.

Distribution of Chlorine

In bleaching sulphite pulp an amount of chlorine is used which corresponds to 100% and more of the lignin present, and the question is often asked regarding the distribution of the chlorine in the chlorination process. Table V is an attempt to show this distribution.

The material balances of the products before and after chlorination are quite satisfactory considering the nature of the operations carried out and the types of materials being handled. Since the waste liquors contain not only the neutral and acid nonvolatile material derived from the chlorinated pulp but also free hydrochloric acid, the solutions were neutralized with a known amount of sodium hydroxide and the quantity of caustic, as well as the water of neutralization, was taken into consideration in the calculations.

TABLE V.—MATERIAL AND CHLORINE BALANCE ON CHLORINATION

Pulp	A-35	A-75	B-35	B-75
1. Pulp used, moisture-free, g....	600.0	600.0	600.0	600.0
2. Cl consumed, g.....	12.4	26.4	41.2	87.9
Cl consumed, (% on total reactants)	2.0	4.2	6.4	12.8
3. Total reactants, g.....	612.4	626.4	641.2	687.9
4. Recovered material				
a. Chlorinated pulp, % (Based on 3)	96.1	93.5	85.5	75.5
b. Dissolved in the waste liquor, %	4.8	8.7	13.5	22.7
5. Total of material recovered, %	100.9	102.2	99.0	98.2
6. Cl content of moist pulp, %..	0.2	0.24	0.7	0.74
7. Nonvolatile solids in waste liquor (4 b, after evaporation)	3.5	5.9	9.7	13.5
8. Total Cl in waste liquor, %...	1.8	3.9	5.5	11.1
9. Cl content of 7, %.....	0.68	1.1	1.7	2.9
10. Cl as HCl in waste liquor, %.	1.2	2.8	3.8	8.4

It can be seen that the total amount recovered adds well up to 100% (Item 5, Table V). Of the chlorine consumed, only a small percentage remains in the pulp (Item 6) and since the chlorine reacts exclusively with the lignin, it is evident that Pulp B with its higher lignin content has a higher chlorine content than Pulp A, which is almost in the same ratio as the lignin contents. The greater amount of chlorine is found in the waste liquor, shown by comparison of Item 8 with Item 2. Of the chlorine in the waste

bleach liquor, the larger portion is found to be present as hydrochloric acid (56 to 66%). These values are in good agreement with those reported by Rys *(1)* and Rauchberg *(2)* who found that 54 to 70% of the chlorine consumed is converted to hydrochloric acid. The data further show that the greater the amount of chlorine used, the greater is the percentage of hydrochloric acid formed, indicating that more oxidation takes place. The chlorine content of the dried pulp is lower than that of the moist pulp, which indicates that on drying some chlorine is split off. The remainder of the chlorine is combined with the nonvolatile solids in the waste bleach liquor. The chlorine contents of the pulp and of the nonvolatile solids, and the chlorine present as hydrochloric acid, have been determined individually and the sum of these results corresponds very well with the amount of chlorine consumed. With increasing chlorine consumption, the chlorine content of nonvolatile solids increases, but not in the same ratio as the yield of chlorinated pulp decreases. Since the chlorine reacts exclusively with the lignin, it must be more highly chlorinated in the waste bleach liquor when larger amounts of chlorine and rawer pulps are used (Item 9). In the chlorination of Pulp A with its low lignin content, lignin only is removed, whereas for Pulp B, with its higher lignin content, materials other than lignin are rendered soluble to an extent of about 20% of the total loss. The amount of these products depends upon the quantity of chlorine used. The nature of the material dissolved in addition to the lignin has not been investigated.

TABLE VI.—PROPERTIES OF CHLORINATED PULPS

K. Lig. = Klason lignin from pulp; W. Lig. = Willstätter lignin from pulp; B. Lig. = Benzidine lignin from liquors; B.R. Lig. = Benzidine lignin from caustic-treated residues of chlorination liquors

Black Sprucewood

Pulp A		Pulp	A	B	Pulp B	
Yield, %	= 49.5				Yield, %	= 63.6
K. Lig., %	= 3.85				K. Lig., %	= 15.2
Roe No.	= 5.90				Roe No.	= 19.6
$KMnO_4$ No.	= 20.9	[1]K. Lig. S, %	= 4.51	4.79	$KMnO_4$ No.	= 47.8
S, %	= 0.32	[2]W. Lig. S, %	= 4.83	4.85	S, %	= 0.86
MeO, %	= 0.74	[2]K. Lig. MeO, %	= 13.2	15.1	MeO, %	= 2.78
		[3]W. Lig. MeO, %	= 13.4	14.9		

	Chlorinations A-35	Chlorinations A-75	Chlorinations B-35	Chlorinations B-75
Pulp				
Yield, %	98.1	97.7	91.4	86.3
K. Lig., %	2.05	1.34	8.88	5.44
Roe No.	3.08	2.32	10.72	6.08
$KMnO_4$ No.	12.1	6.7	29.0	21.0
S, %	0.17	0.10	0.53	0.42
Cl, %	0.14	0.17	0.64	0.67
MeO, %	0.57	0.29	1.66	0.99
Klason Lignin				
[1]Cl, %	2.71	6.33	5.06	5.25
[2]S, %	3.82	2.65	3.59	2.21
[3]MeO, %	10.55	7.38	12.29	7.21
Benzidine Lignin				
[1]Cl, %	15.80	19.11	15.11	21.25
[2]S, %	4.52	4.15	4.05	3.30
[3]MeO, %	5.40	3.81	6.35	3.46
Benzidine Lignin from Caustic-Treated Residues of Chlorination Liquors				
[1]Cl, %	14.50	15.85	14.82	18.45
[2]S, %	4.45	3.41	4.06	3.02
[3]MeO, %	5.46	3.38	6.59	3.04

	Caustic Extractions A-35-20	A-35-80	A-75-20	A-75-80	Caustic Extractions B-35-20	B-35-80	B-75-20	B-75-80
Pulp								
Yield, %	98.4	97.3	99.5	100.0	97.9	95.6	97.0	97.0
K. Lig., %	1.95	1.75	0.75	0.64	6.66	5.95	4.62	4.05
Roe No.	2.62	2.25	1.40	1.22	9.75	9.18	5.23	5.02
$KMnO_4$ No.	10.4	10.2	6.3	5.5	28.3	25.7	18.5	16.1
S, %	0.14	0.12	0.07	0.06	0.44	0.39	0.25	0.23
Cl, %	0.12	0.08	0.11	0.09	0.29	0.24	0.19	0.19
MeO, %	0.49	0.46	0.29	0.30	1.54	1.46	1.02	0.94
Klason Lignin								
[1]Cl, %	3.29	2.94	3.62	3.04	1.70	1.45	5.15	4.69
[2]S, %	3.87	4.11	3.04	2.86	3.18	3.34	3.19	3.24
[3]MeO, %	12.49	12.43	9.11	8.72	14.11	13.91	13.28	13.21
Benzidine Lignin								
[1]Cl, %	....	8.50	....	....	9.36	9.30	13.21	11.82
[2]S, %	....	4.45	....	....	3.78	4.11	3.21	3.04
[3]MeO, %	....	10.69	....	....	8.98	8.96	4.63	5.25

[1] All chlorine values are corrected to sulphonate-, benzidine-, and ash-free basis.
[2] All sulphur values are corrected to chlorine-, benzidine-, and ash-free basis.
[3] All methoxyl values are corrected to chlorine-, benzidine-, ash-, and sulphonate-free basis.

Properties of Chlorinated Pulps

When Pulp A is chlorinated with 35 and 75% chlorine, the lignin content drops from 3.85% to 2.05 and 1.34%, respectively. This shows that a considerable amount of lignin has been rendered water soluble and that the amount of dissolved lignin increases with the amount of chlorine used. The same tendency can be seen in the chlorination of Pulp B. In this case 41.5 and 64.5%, respectively, of the lignin is removed. It is often stated that the principle part of the chlorinated lignin is removed only by an alkaline extraction process but, as indicated here, this is not true. The amount of lignin removed by an alkaline extraction of the chlorinated pulp depends entirely on the conditions under which the pulp has been chlorinated.

When a pulp of low lignin content is chlorinated with 35% of the chlorine required, the amount of lignin removed on an alkaline extraction is only 5% at 20 deg. C., but this amount increases not only with the increase of the consumed chlorine, but with the temperature at which the extraction is carried out and is greater in pulps with higher lignin content, even when the same percentage of the required chlorine is used. An increase of the temperature for the alkaline extraction exerts a favorable effect on the extraction (but this effect will not make up the costs of heating). As stated above, a major amount of the chlorine consumed is converted into hydrochloric acid. It is obvious that this should be washed out prior to the alkaline extraction as it otherwise would consume an equivalent amount of alkali.

At this point the question may be discussed as to whether sodium hydroxide has to be used for the alkaline extraction or whether lime water may be used. It is a well-known fact that calcium lignosulphonate is soluble in water, but begins to precipitate on the addition of lime water at a pH of about 7; when an excess of lime water is added to a calcium lignosulphonate solution and the pH of the solution is increased to 11, the calcium lignosulphonate is almost entirely precipitated as a basic calcium salt which is insoluble in water. The fact that excess lime precipitates basic calcium lignosulphonate indicates that when lime water is used for the alkaline extraction the pH has to be watched very carefully and should not exceed 6.5 On chlorination of the pulp the lignin is chlorinated and the chlorine content increases with the amount of chlorine consumed.

The alkaline extraction also exerts an effect on the chlorinated lignin. When Pulp B-35, the lignin of which has a chlorine content of 2.71%, is extracted the chlorine content of the chlorinated lignin increases slightly, probably due to the removal of lower chlorinated lignin materials (Table VI). However, when the lignin is more highly chlorinated, chlorine is split off by the alkali. This removal of chlorine must be considered in calculating the amount of alkali used for the extraction, especially when lime is used, because this chlorine will consume alkali.

The lignin in sulphite pulps is sulphonated. The degree of sulphonation depends, according to the literature, on the cooking conditions. In spite of the fact that Pulps A and B differ considerably in their

lignin contents, the sulphur contents of their lignins is almost the same (4.75%). When the pulps are chlorinated, the sulphur content of the lignin decreases. With chlorine consumption of 35% for Pulp A, this decrease is 15.4%, in spite of the entrance of only 2.7% chlorine; with 75%, the decrease is 41% with an entrance of only 6.3% chlorine. For Pulp B, this difference is even greater, which shows that the entrance of the chlorine into the lignin unit (thus increasing the molecular weight) is not the only reason for the decrease in sulphur content. It is caused either by the splitting off of sulphonic acid groups or by the removal of higher sulphonated lignins. That a part of the sulphur has been split off is shown by the fact that sulphuric acid is found in the bleaching waste liquors from the chlorinated pulp. The amount of sulphur split off increases with the amount of chlorine consumed in the chlorination. This is not surprising as an entrance of more chlorine into the lignin molecule will loosen the sulphonic acid group.

A considerable part of the lignin goes into solution only on chlorination. This dissolved part is present in the solution as a chlorinated lignosulphonic acid and is isolated from it as its benzidine salt. The chlorine content of this chlorinated lignosulphonic acid is about 15% and increases up to 21%, depending upon the amount of chlorine used. The sulphur content of this soluble chlorinated lignosulphonic acid is not changed appreciably when 35% of the required chlorine is consumed but when 75% of the chlorine is used the sulphur content decreases somewhat more than is accounted for by the increase in the molecular weight produced by the entrance of the chlorine.

When the chlorinated pulp is extracted with alkali a small amount of lignin goes into solution. When chlorinated lignin is treated with sodium hydroxide a part of the chlorine is split off. This amount increases with the higher chlorination, and, when the alkaline extraction is carried out at a higher temperature. The same tendency is observed with the water-soluble chlorinated lignosulphonic acid, from which almost 50% of the chlorine is removed.

It has been shown by Brauns *(3)* that in the bleaching of pulp, methoxyl groups are split off from the residual lignin. The same observation is made in this investigation. Table VI shows definitely that the greater the degree of chlorination, the greater is the loss of methoxyl. An especially low methoxyl content is found with the water-soluble part of the chlorinated lignosulphonic acid and this loss may contribute to its solubility. Sodium hydroxide treatment of the soluble chlorinated lignosulphonic acid apparently has no effect on the methoxyl content, but caustic extraction of the pulp tends to remove the lignin with the lowest methoxyl content, probably because of the presence of more free phenolic hydroxyl groups.

TABLE VII.—METHANOL AND ALKALI LIGNINS

Lignin Derivative	Mol. Wt.	No. of MeO Groups	No. of OH or AcO Groups	MeO Calcd.	MeO Found	AcO Calcd.	AcO Found	S Found	Cl Found
Native Lignin...	838	4	4 OH	14.8	14.8	...	...	...	...
Methanol N. L...	886	6	4 OH	21.0	20.9	...	...	...	...
B-MeOH-I	872	5	5 OH	17.8	17.2	...	...	4.44	...
Methylated	900	7	3 OH	24.1	23.2	...	...	4.38	...
Acetylated	1066	5	5 AcO	14.5	13.7	20.2	18.7	...	...
B-MeOH-II	840	4	5 OH	14.8	14.4	...	...	3.88	...
Methylated ...	854	5	4 OH	18.1	17.8	...	...	3.82	...
Acetylated	1050	4	5 AcO	11.8	11.8	20.5	21.6	...	...
B-75-I	798	1	.....	3.9	5.4	...	...	2.93	27.5
	812	2	.....	7.7	5.4	...	...	...	...
B-75-MeOH	826	3	6 OH	11.3	12.1	...	...	3.14	15.8
Methylated ...	840	4	5 OH	14.8	14.0	...	...	2.78	15.7
Acetylated	1062	3	6 AcO	8.8	8.8	24.3	26.2	...	...
B-NaOH	840	4	5 OH	14.8	14.3	...	...	2.45	...
Methylated ...	868	6	3 OH	21.4	20.2	...	...	2.30	...
Acetylated	1050	4	5 AcO	11.8	11.2	20.5	21.1	...	...
B-75-NaOH	826	3	5 OH	11.2	9.0	...	...	2.61	3.7
Methylated ...	854	5	3 OH	18.1	16.9	...	...	2.71	3.4
Acetylated	1036	3	5 AcO	9.0	7.2	20.8	19.9	...	...

Alkali and Methanol Lignins

The preparation of methanol and alkali lignins from the sulphite and the chlorinated sulphite pulp was carried out to compare the lignins and in this way to study more closely the mechanism of the chlorination reaction of the lignin. The reaction taking place between methanol and lignin in wood in the presence of small amounts of hydrochloric acid is known *(4)*, and it is known that the methanol lignin is changed to a lesser degree than in other methods of isolation. The alkali lignin from the chlorinated pulp should give an indication as to whether new hydroxyl groups are formed or lost by the removal of chlorine from the lignin by sodium hydroxide. The lignins so obtained were methylated with diazomethane and acetylated. The analytical results of these lignin derivatives calculated on an ash-, sulphonate- (SO_3H), and chlorine-free basis, are given in Table VII, together with the molecular weights and groups derived from the formula for lignin as suggested by Brauns *(4)* for native lignin $[C_{42}H_{32}O_6(CH_3O)_4(OH)_4—C'=O]$, and methanol native lignin $[C_{42}H_{32}O_6(CH_3O)_4(OH)_4—C'(OCH_3)_2]$.

The two methanol lignin fractions (B-MeOH-I and B-MeOH-II) are seen to have different compositions as regards methoxyl and hydroxyl groups, and both differ from methanol native lignin in that B-MeOH-I has one, and II has two less methoxyl groups. Compared with native lignin, B-MeOH-I has one methoxyl group added, whereas in B-MeOH-II the number of methoxyl groups has not changed. This indicates that the group in lignin which reacts with methanol in the presence of hydrochloric acid has already reacted in the sulphite cooking process, a fact which has been pointed out by Brauns *(4)*. The entrance of only one methoxyl group into lignosulphonic acid on treatment with methanol-hydrochloric acid was found by King, Brauns, and Hibbert *(5)*. The residual lignin in sulphite pulp reacts towards methanol-hydrochloric acid, at least in part, in the same way as isolated lignosulphonic acid. The blocking of the position for the entrance of another methoxyl group when treated with methanol is doubtless due to the sulphonic groups in the lignin. In lignin B-MeOH-II no new methoxyl group has been added and with diazomethane one hydroxyl is methylated, whereas in B-MeOH-I two new methoxyl groups are introduced by this reagent. In the latter case, in addition to a phenolic hydroxyl group, the sulphonic acid group is probably esterfied, but it cannot yet be decided which hydroxyl group has been methylated in Sample B-MeOH-II.

The methanol lignin from the chlorinated pulp (B-75-MeOH) has two less methoxyl groups but one more hydroxyl group than B-MeOH-I and one less methoxyl group and one more hydroxyl group than B-MeOH-II. Methylation of B-75-MeOH with

diazomethane adds one methoxyl group. The new hydroxyl group in this lignin apparently originates through the loss of a methoxyl group and may be aliphatic in character. Since on treatment of the chlorinated lignin with methanol or of lignin with methanol-hydrochloric acid, methylation usually takes place, it would indicate that the lignin in Pulp B-75 has a lower methoxyl content, which is increased first by the action of methanol-hydrochloric acid. This is supported by the lower methoxyl content in the alkali lignin from this pulp.

Since methanol lignins I and II are obtained in nearly equal amounts, the chlorination treatment must have removed most of fraction I or altered the hydroxyl groups. This is borne out by the seven methoxyl groups of methylated methanol lignin I as compared with four methoxyl groups for the methanol lignin from the chlorinated pulp. The water-methanol-soluble lignin (B-75-I) was probably a part of the lignin that had been attacked more severely.

A comparison of alkali lignin from Pulp B and its acetylated product agrees closely with the methanol-soluble methanol lignin and its acetylated product; however, the methylated products are different. The methylation indicates the presence of two acidic or phenolic hydroxyl groups in the alkali lignin as is in the methanol-insoluble methanol lignin. The alkali lignin has one more hydroxyl group than native lignin.

The alkali lignin from the chlorinated pulp (B-75-NaOH) shows a loss of slightly more than one methoxyl group. Since methylation with diazomethane increases the number of methoxyl groups by two, and since the total number of methoxyl and hydroxyl groups is slightly less than eight, it can be concluded to be the same as alkali lignin with one less methoxyl group.

The chlorine value for B-75-NaOH corresponds to a little less than one chlorine atom per lignin molecule of 874 (4.15%) whereas the chlorine content of B-75-MeOH corresponds to somewhat more than four chlorine atoms per lignin unit of 978 (14.6%). This shows that the alkali splits off about three atoms of chlorine per lignin unit. The chlorine content of the lignin obtained on dehydration of the chlorinated pulp with methanol (B-75-I) corresponds to nine chlorine atoms in a lignin unit of 1151 (27.7%).

The sulphur content of the methanol lignins (average, 4.13%) agrees fairly well with the sulphur content of Klason and Willstätter lignins from Pulp B (4.79 and 4.85%). The alkali lignin (Sample B-NaOH), however, has a lower value (2.38%), which shows further that alkali tends to split sulphur from the lignin. The chlorination treatment also splits off sulphur as can be seen from B-75-MeOH. The caustic treatment splits off as much sulphur in the unchlorinated as in the chlorinated sample (B-NaOH and B-75-NaOH). The sulphur content of a sulphonated lignin unit containing one sulphonic group would be 3.5%.

Literature Cited

(1) Rys, L., *Papier-Fabr.* 26:256-260, 269-275, 288-289 (1928).
(2) Rauchberg, Herbert, *Papier-Fabr.* 29:490-497, 516-524, 535-541 (1931).
(3) Brauns, F. E., *Paper Trade J.* 103, no. 5:36-39 (July 30, 1936).
(4) Brauns, F. E., *J. Am. Chem. Soc.* 61:2120-2127 (1939).
(5) King, E. G., Brauns, F. E., and Hibbert, Harold, *Can. J. Research* 13B:88-102 (1935).

New England TAPPI Hears E. W. Tinker

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Roger Smith Hotel, Holyoke, Mass., on Friday evening, November 14 at 6:30 P.M. Norman I. Bearse of the Champion International Paper Company, Lawrence, Mass., presided as chairman.

E. W. Tinker, executive secretary of the American Paper and Pulp Association was the principal speaker and discussed the relations of the paper industry to the national defense program. Mr. Tinker pointed out the critical nature of paper in the national economy, describing the important steps that have been taken to date.

The first step related to the initial fear of a paper shortage due to the discontinuance of woodpulp imports from the Scandinavian countries which was about 20 per cent of the national requirements. The second step was the voluntary agreement by the pulp manufacturer to establish a price ceiling on pulp on July 25. The third step dealt with chlorine conservation, bringing in, as it did the problem of the captive plants. This is expected to lead to an allocation system since the priorities system has not worked out satisfactorily.

Under the allocation system the minimum requirements of the industry relative to machinery and supplies are being ascertained. Together with this survey an effort is being made to find out what conservation may be effected.

There is no critical shortage of paper at present and there probably will be none in 1942.

Mr. Tinker's talk was followed by an interesting discussion period and a presentation of the technicolor illustrated lecture on lubrication by Mr. Wyman of the Socony-Vacuum Corporation, New York, N. Y. In this lecture it was shown how the evils—temperature, dust, pressure and water should be met. Those present were:

C. S. Adams, H. T. Barber, P. S. Barnhart, N. I. Bearse, D. W. Bell, H. F. Bigelow, R. T. Bingham, R. F. Blount, J. M. Booth, J. H. Brougham, Charles Champion, S. B. Dickerman, R. H. Doughty, H. E. Duston, F. C. Empey, W. F. Erisman, H. Federhen, Thomas Flaherty, C. E. Flint, W. L. Foote, P. B. Fowler, J. G. Greene, W. F. Hoffman, C. I. Horton, W. S. Hughes, O. F. Hutchinson, H. G. Ingraham, Frank A. Johnson, Werner Kaufmann, W. H. Kenety, H. U. Kiely, A. D. King, A. P. Lesage, R. A. Libby, E. M. Loveland, R. G. Macdonald, R. D. McCarron, R. D. Metcalf, E. O. Nash, W. A. Niviling, C. R. O'Neill, G. A. Peterson, J. P. Phelps, R. J. Proctor, J. F. Reardon, W. G. Russell, F. W. Schneider, Norman, Shea, T. L. Sterling, D. L. Swan, G. H. Thomson, E. W. Tinker, L. B. Tucker, C. A. Weymouth, J. P. White, Howard Whittman Anthony Wolwicki, J. F. Wright, G. R. Wyman and L. M. Yoerg.

To Make Wallboard from Seaweed

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 12, 1941—Ireland researchers have recently developed two patented processes for manufacturing wallboard from seaweed, reports to the Department of Commerce reveal. The board is manufactured from the organic content of the seaweed after extraction of iodine and potash. The Industrial Research Council of Ireland, which developed the process, is now considering practicability of commercial use of the patents.

Measuring the Internal Bonding Strength of Papers

By E. Sutermeister[1] and H. W. Osgood, Jr.[2]

Abstract

A survey, made by the Technical Association of the Pulp and Paper Industry, indicates the growing importance of the problems confronted by the paper manufacturers due to high-speed printing presses and tacky gloss inks. Splitting of the paper was indicated as a major difficulty. Tests must be developed to show what factors affect the strength of paper and when it is strong enough to do the work intended. A mechanical device is described which will measure the resistance of paper to splitting.

An inquiry by the Technical Association of the Pulp and Paper Industry indicated that splitting or peeling of coated papers in offset printing was quite generally recognized as a defect due partly to the paper and partly to printing technique *(1)*. In the report, 10 different reasons for splitting were mentioned; 6 answers gave too tacky ink as the cause and 14 blamed weak body stock. This not only indicates the complexity of the problem but also shows how prevalent is the opinion that poor body stock is to blame.

Like many other problems confronting the papermaker this one is becoming more and more serious because modern high-speed presses and tacky, gloss inks make greater demands on the paper. This in turn means changes in manufacturing procedures, and, if these are to be made intelligently, tests must be developed which will show what factors affect the strength of the paper and when it is strong enough for the work in question. It is with this latter phase of the problem that the present paper deals. While there is nothing basically new in the tests described, it is felt that a discussion of their applicability may be of value.

In theory the ideal test for resistance to splitting of coated papers or body stocks should differentiate between grain directions in the sheet, and between wire and felt sides, and should show the cohesion of the fibers within the body of the paper. Since splitting develops during the removal of an inked surface from the paper, the natural approach to the problem would be to apply some tacky substance to the paper and then remove it in a standard way which would permit duplication of results and interpretation in terms of printing. Many efforts have been made along these lines but none has apparently been entirely satisfactory; at least none is in general use or even widely known.

Before developing the present instrument, which will be described later, numerous attempts were made to use adhesive tapes applied to the paper to be tested, or to use a very tacky, slowly penetrating adhesive which was placed on the paper and then pressed onto a standard paper which was considered strong enough. On pulling these apart, the weaker sheet split and thus gave a measure of relative strength. No such test exactly duplicates the pull of the printing press and all are difficult to carry out in a reproducible way, especially if the papers are separated by hand rather than by mechanical means. To eliminate all possible variables, a machine was constructed in which strips of the sample and of a standard paper were fastened opposite each other on two cylinders which could be caused to rotate in contact. A small amount of a tacky adhesive—e.g., Canada balsam or rezyl balsam—was placed on one strip and the cylinders revolved, slowly the first time to spread the balsam equally on both papers, and rapidly the second time to cause the weaker sheet to split.

These instruments are still in use for routine testing and have proved to be rapid in operation and of considerable value. They show differences in the sides of a sheet and between machine and cross directions, but they do not give numerical results; they depend on the use of a standard paper which may be more or less variable and which may change with age, and they are not entirely free from the personal equation of the operator. For some unknown reason it is not possible to test a body stock against a standard body stock, though fairly good results are obtained if it is compared with a standard coated paper.

Using these instruments many studies were made of the factors affecting splitting. Some of these have been checked on the new instrument and found accurate, but some have not proved as reliable. It is felt that this type of instrument is worth using if nothing better is available; but it is our present belief that the new instrument, which we have called a "bondmeter," gives much more reliable information regarding splitting propensities.

This device measures the force required to split the paper when the stress acts vertically to its surface. It is well known that others have used tests of a similar nature at various times and in 1930 Sutermeister and Porter *(2)* described an attempt to use the Schopper tensile tester for this purpose. At that time the paper was fastened between brass blocks by means of silicate of soda, and the test results were dependent on the amount of silicate used and on the time the assembled blocks were seasoned before the break was made. The time required was excessive and the results so uncertain that no great use of the test was made. Our more recent instrument and technique have overcome most of these difficulties.

The bondmeter as made and set up in our laboratory is shown in Fig. 1. In "A" the assembled blocks are in position ready to split, and in "B" they are shown after the test is made. The wooden holder on the table shows the brass blocks before and after assembling and after breaking. The instrument consists simply of a piston which can be caused to move up and down in a cylinder by means of compressed

[1] Member TAPPI, Chief Chemist, S. D. Warren Co., Cumberland Mills, Me.
[2] S. D. Warren Co., Cumberland Mills, Me.

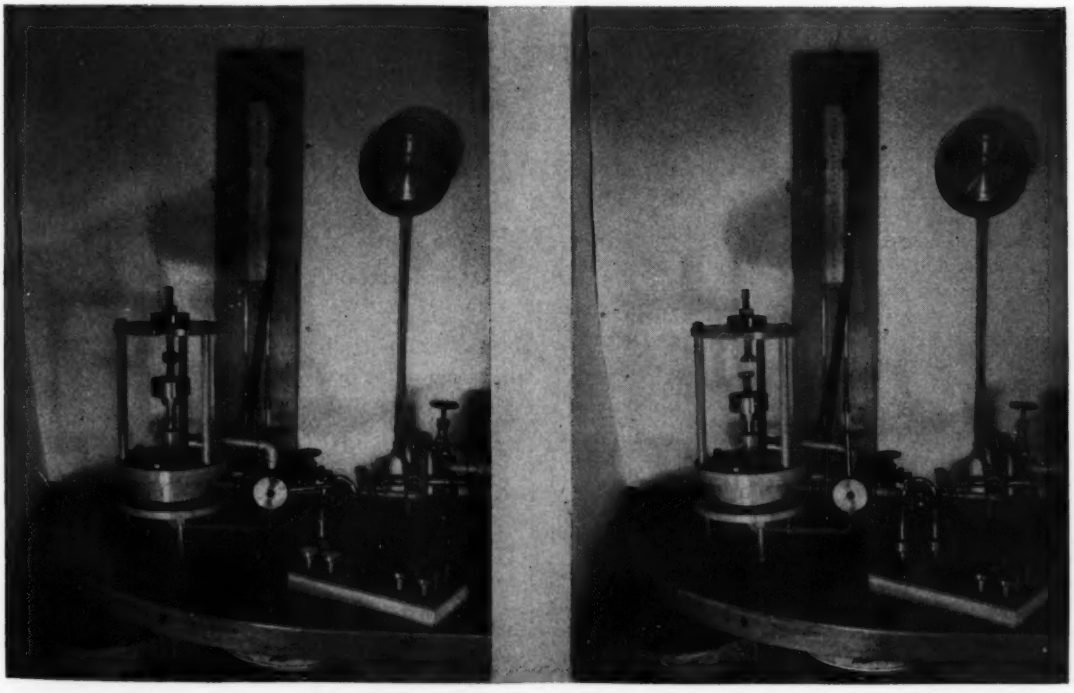
air. The assembled blocks are placed between the two universal joints when the piston is up; a reversal of the 4-way cock then permits the piston to be forced down and the break made. The pressure required is noted on a mercury gage, and this is then calculated to pounds per square inch of paper surface. The air pressure for moving the piston is supplied through a manually operated Watts pressure regulator.

The usual amount of grief was experienced while developing this instrument, and it was not until the universal joints were added that dependable results were obtained. The method of fastening the paper between the brass blocks was perfected only after many trials and failures. Silicate and other aqueous adhesives were not satisfactory because of penetration into the paper, seasoning time, etc. Other materials in organic solvents proved unsatisfactory for various reasons, but such hot-melt materials as shellac and sealing wax might possibly be used if the proper method of controlled application could be worked out. It was found that differences in penetration of sealing wax very greatly affected the results, sometimes more than doubling the force required, and it was fortunate that its use proved unnecessary.

The final solution of the adhesive problem was tacky sheet rubber as prepared in single thickness for tire tread repair work. In assembling the test blocks the paper is first covered with a sheet of the rubber and on this is pressed one of a pair of blocks which has been heated to about 125-130 deg. C. The second hot block is pressed onto a sheet of the rubber which rests on a special paper from which it can be easily peeled. Each block is then trimmed with shears or otherwise so that no paper or rubber extends beyond its surface and the two are assembled in a special holder at 300 pounds per square inch pressure for about 1 minute. After the assembled blocks are cooled to room temperature they are ready to test. It has been found that when so prepared it requires a force of about 145-150 pounds per square inch to strip the rubber from the brass by a vertical pull; this is far stronger than any offset paper so far tested.

The practical value of this instrument depends, of course, on its ability to tell whether paper or paperboard is strong enough to print without blistering or peeling. This means that standards must be set up by the apparently easy method of testing papers which have proved too weak and others which were strong enough. Unfortunately paper which is satisfactory in one shop and with one type of ink may prove weak in another pressroom or even in the same shop under different conditions or with different inks. For this reason there may be quite a range over which the paper may be satisfactory or not, depending on conditions for which it is not responsible, so any standards which are established must be considered as tentative only and "subject to change without notice." At present it is considered that paper showing a bond test of 54 pounds per square inch is strong enough for average offset printing, but that for fast operation with very tacky gloss inks, a strength of 68 pounds, or even higher may be needed. Since it is not possible to foretell in which direction the paper will be passed through the press, these standards have been established on the assumption that it will be run in the weakest direction. They also refer to coated book paper; little work has been done with other grades.

After constructing the bondmeter it became necessary to study the methods for handling it, and to see what factors needed to be controlled in order to obtain reliable data. Enough of this work has been done to enable it to be used with a high degree of success, but the limiting conditions have not yet been fully established.



A. FIG. 1 B.

Using the rubber adhesive it was found that higher temperatures and pressures while assembling the blocks gave better results. Attempts to work at room temperatures gave poor adhesion of the rubber to the brass and frequently the break was between the brass and rubber rather than in the paper. Temperatures higher than 130 deg. C. and assembly pressures in excess of 300 pounds have not been tried as they seemed unnecessary. The time which the blocks must be held under pressure has also not been determined, except to ascertain that 1 minute was sufficient. Quite possibly it could be considerably reduced.

The time for cooling and the temperature at which the test is made have been studied only enough to prove that 15 minutes in a current of air at 72 deg. F. will cool the blocks sufficiently to give reproducible results, and that block temperatures between 72 and 110 deg. F., while the test is being made, cause no appreciable errors.

The rate at which pressure is applied to the piston doubtless has an influence on the test and it would be well if it could be applied at a constant rate. With a hand operated instrument this can be done only approximately, so two operators might get slightly different results. The importance of uniform loading may be inferred from tests on two papers which, under normal manual operation, split at 62.7 and 52.7 pounds, respectively. When the load was brought up to 58.8 pounds and held there the first paper broke in 5 seconds, while at a maintained pressure of 53.2 pounds it broke in 60 seconds. At 42.5 pounds pressure the second paper broke in 230 seconds, and at 46 pounds in 30 seconds.

The universal joints on the bondmeter are essential and contribute greatly to the reliability of the tests. Before their installation variations in the tests which were laid to the paper were actually due to the instrument. A sheet of paper which was tested at intervals of 3 inches across the full width of the machine gave the following bond strengths in pounds per square inch.

	With universal joints	Without universal joints
Maximum	65.6	64.6
Minimum	58.9	37.1
Average	62.5	55.6

Without the joints all averages tend to be low because the stress seldom acts perfectly normal to the surface. With the joints, papers seldom vary more than 5% above or below the average and three tests on a sample seem to be enough to give reliable figures.

The bondmeter makes it possible to study many of the factors which influence the internal strength of a sheet of paper. Considerable work has been done along such lines but the detailed results cannot be published at this time and even generalizations from them are offered with some misgivings because they have not been checked a sufficient number of times or under sufficiently varied circumstances.

The effect of beating is shown by the following figures for several different fibers taken at random from a considerable number of tests.

It is obvious that beating affects the bond strength, but it seems peculiar that for a given amount of beating the bond strength of short fibered stock, such as soda poplar or waste papers, increases more than that for sulphites. Whether this difference is due to the number of fiber contacts per pound of fiber

TABLE I

Beating in pebble mill, min.	Bond tests on bleached fibers			
	Sulphite 1	Sulphite 2	Sulphate	Soda poplar
20	18	9	9	36
40	29	18	37	48
60	40	35	57	113

Time in mill beaters, min.	Bond tests on laboratory sheets
15	15.5
35	24.5
55	36.5
75	44.5
92	48.5

or to some inherent quality of the different fibers is not known.

Fillers such as clay and calcium carbonate reduce the bond strength seriously. The effect of clay is a straight line function over the range of 0 to 14% in the paper, and the strength is reduced by 1.9 pounds for each 1% present. Still further reduction is caused by using size and alum.

Coating a body stock raises its bond strength slightly, but calendering the coated paper reduces it to a point a little below that of the body stock.

For laboratory sheets of pebble milled stock there is an increase in bond strength as the weight per ream rises. This is not as marked for laboratory sheets made from mill beaten stock, nor for Fourdrinier papers of different weights made from the same stock. In one such case there was even a decrease in bond strength with increasing ream weight.

For uncoated sheets of approximately the same ream weight there is a direct correlation between bond and bursting strengths. Conditions which increase the bursting strength also increase the bond strength, the ratio of change being about 1 pound burst for 3 pounds bond. When the bursting strength is increased by increasing the ream weight the correlation between the two tests no longer holds.

The bond test of an unsized sheet can be raised greatly by giving it an impregnation treatment with glue, dextrine or similar material, but passing a sized paper through a similar bath does not strengthen it internally. In a similar way an unsized body stock will be strengthened by a coating mixture if this is squeezed into the sheet, but not if it is merely laid on the surface.

It was anticipated that the test method might be used as a substitute for the wax test for coating strength but in one case where the wax removed the coating entirely from the paper surface the bondmeter gave a rupture of the body stock, just as though no coating had been present. A lacquered paper, from which the lacquer could be peeled, gave a body stock rupture on the bondmeter.

While this method of testing does not differentiate between sides or grain directions it has been found to correlate excellently with printing results and it makes it possible to evaluate complaints and locate the cause in either the paper mill or the printing plant. It has done much to confirm the belief that when the finished paper is at fault the defect lies in the body stock, and that it is practically impossible to change the bond strength by any known modification of the usual coating operations.

Literature Cited

(1) TAPPI Staff, TAPPI Special Report 305, New York, Technical Association of the Pulp and Paper Industry (June 12, 1940). 12 pp.

(2) Sutermeister, E., and Porter, L. W., *Paper Trade J.* 90, no. 12:73-74 (March 20, 1930); *Tech. Assoc. Papers* 13:206-207; discussion, 38-39 (May, 1930).

Preparation of Bleaching Solutions

By Roy P. Whitney[1]

Abstract

Demands of the Defense Program have resulted in a serious shortage of chlorine, and it is essential that chlorine production be maintained at a high level. In certain cases of electrolytic plants without facilities for liquification of the gas, the production and shipment of bleach solutions may be a desirable means of utilizing their full capacity. This article discusses briefly the design and operation of equipment for the preparation of chlorine water and calcium hypochlorite, and the strength and stability of the solutions which are obtained.

Demands of the Defense Program have resulted in a serious shortage of chlorine which may well continue throughout the emergency. This situation is causing a readjustment of usage and will necessitate a distribution of the country's chlorine production in a way most effectively to meet the important needs.

A considerable fraction of the United States production comes from electrolytic plants which do not have facilities for liquifying chlorine for shipment, because the chlorine is normally used on the premises as a gas or in a bleach solution. Most chlorine plants located in pulp mills fall into this category. In those cases where a reduction of chlorine consumption by the producing company is called for, the electrolytic plant may be left with excess chlorine capacity.

One ready method for utilizing this capacity is the preparation and shipment of bleach solutions which could be used in such essential operations as water purification and sanitation in adjacent communities. Equipment for the preparation of bleaching solutions is comparatively simple and its construction can usually be carried out by the mill. It is the purpose of this paper to discuss briefly the design and operation of such equipment, and the strength and stability of the solutions which are obtained.

Chlorine Water

Chlorine water is usually prepared in a packed tower, which provides for contact in a countercurrent manner between the chlorine gas introduced at the bottom and water sprayed in at the top. The packing is some form of ceramic material which provides a large surface of contact per unit tower volume. Two-inch Raschig rings are one of the most satisfactory types for this purpose. The tower operates in a continuous manner, with the water leaving the bottom as finished chlorine water. This product flows to a closed storage tank, vented back to the tower itself, and is pumped to the mill as required.

For a detailed discussion of the design of such equipment, the reader is referred to previous papers by Whitney and Vivian *(2, 3)*. Reference to their data indicates that a liquor concentration of 5 grams of chlorine per liter can easily be realized, but that for higher concentrations, the necessary size of the tower increases rapidly. To cite a specific example, consider a plant with a chlorine production of 5 tons per day, of which half goes to chlorine water containing 5 grams of chlorine per liter. With a cell gas strength of 80% chlorine and a summer water temperature of 75 deg. F., the requirement could be met with a tower 3 feet in diameter, with a packed height of 15 feet.[2] Allowing for free space above and below the packing, the over-all height would be about 19 feet. Water would be fed to the tower at the rate of 83 gallons per minute, and the partially stripped gas from the top of the tower would be used to prepare

The operating difficulties encountered with such a system are few. The most common source of trouble is air leakage into the gas stream or into the tower itself, thereby lowering the concentration of chlorine in the gas and the ultimate liquor strength which can be realized. It also is necessary to guard against water temperatures which are too low which might result in chlorine hydrate formation. Temperature control equipment should be installed and the water temperature kept up to 70 deg. F.

There are comparatively few materials which will withstand the corrosive action of wet chlorine gas or chlorine water. The tower may be constructed of tile or of concrete with a tile lining. Gas lines should be of tile and the storage tank tile-lined. Pipe lines and pumps should be hard rubber or rubber-lined.

Calcium Hypochlorite

Calcium and sodium hypochlorite solutions are prepared in a variety of contacting equipment, ranging from packed towers similar to those used for chlorine water to mixing boxes where the lime or caustic solution is splashed up into the gas stream. This discussion will be confined to the preparation of the calcium compound because of its more widespread use. Equipment which is suitable for this purpose also will operate satisfactorily in making sodium hypochlorite.

Because of the ease of pressure control, the "tower and tank" system is considered to be very satisfactory for preparing calcium hypochlorite from electrolytic cell gas. Lime is slaked and held in slurry form, and the proper amount is introduced to a large tank and diluted to the desired consistency. This lime water is continuously pumped to the top of an absorption tower, and flows from the bottom of the tower back to the tank. The chlorine gas enters the tower at the bottom, and the waste gas is exhausted from the top by a blower, which exerts a suction back through the entire system to the electrolytic cells. Practically complete absorption of the chlorine is obtained. The process is batch as regards the liquor, in that recirculation is continued until the desired end point has been reached, at which point a small amount of unchlorinated lime remains.

Because of the progressive decrease in the alkaline strength of the solution, the difficulty of absorption continually increases. It is evident that the design of the absorption tower should be based on the worst condition, which is represented by the time at which a batch is completed. A tower which will effect practically complete absorption at this condition will be oversize for any other condition which may exist. This tower therefore may be designed on the same basis as was the chlorine water tower above.

[1] Member TAPPI, Director, Bangor Station, Massachusetts Institute of Technology School of Chemical Engineering Practice, Bangor, Me.

[2] Under these conditions the maximum possible concentration, if the water were fully saturated with chlorine, would be 5.4 grams per liter.

Considering further the example which was cited previously, there are available to be absorbed in lime 2.5 tons of chlorine per day in the tail gas from the chlorine water tower. The gas strength is 65% chlorine. The use of a spray tower offers some advantage over a packed tower in this case, because of the possibility of clogging the packing with lime. Calculations indicate that, with a tower diameter of 3 feet, a height of 15 feet below the spray will be satisfactory. With lime water circulated through tower at the rate of 140 gallons per minute, more than 99.5% of the chlorine will be absorbed after the lime has been completely neutralized. In usual operation, the absorption will be considerably higher.

The pressure drop through packed and spray towers such as have been described is small and may usually be neglected in comparison with the drop through the connecting pipe lines. Through both towers, the pressure drop will be no more than one inch of water.

Ordinarily, several storage and circulation tanks are provided to operate with one tower. Thus the time lag between the end of one batch and the start of the next is practically eliminated. The several tanks also allow ample time for settling the finished batches and washing the sludge which collects in the bottom. The size of the tanks is not important, usually being of the order of 8,000 to 12,000 gallons.

Materials of construction offer no great problems in this case. The tanks are usually constructed of concrete, and the tower may be made conveniently from tile pipe. Ordinary iron pumps and lines will have a considerable life, provided the solution is never allowed to reach an acid condition. However, for long-time operation, the use of rubber-lined pipes is to be recommended.

Two major precautions are to be observed in the operation of this equipment. The first has to do with the temperature of the solution. The reaction between chlorine and lime liberates heat, and consequently the temperature of the solution rises as the operation proceeds. The rate of temperature rise will depend upon the rate of absorption, the size of the batch, and the heat losses from the liquor as its circulates. Ordinarily, when preparing the bleach from electrolytic cell gas, the absorption rate is sufficiently low that heat losses account for a considerable part of the heat liberated, and the temperature rise is not serious. However, the temperature of the solution should be watched, and in no case should it be allowed to rise above 100 deg. F., because the solution becomes unstable above that temperature. In some cases, the temperature rise will limit the strength of the hypochlorite solution which may be prepared.

It also is necessary to regulate the procedure so that at no time does any part of the solution become overchlorinated to an acid condition. In an acid medium, both calcium and sodium hypochlorites decompose rapidly to give chlorates and chlorides. The desirable quantity of excess alkali in the finished bleach will be discussed further in connection with the stability of the solutions.

Commercial solutions of calcium hypochlorite for bleaching wood pulp are commonly prepared at a concentration of about 30 grams of available chlorine per liter. O'Neil and Rue *(1)* have shown that when chlorinating a lime suspension containing 32 grams per liter of Ca $(OH)_2$ (stoichiometrially equivalent to 30.7 grams per liter of Cl_2) the pH change is slight until 28 grams per liter of chlorine have been added. Above this point, the pH falls rapidly, and the solution becomes unstable. They recommend stopping at a pH of 11.2, which in this case corresponds to an available chlorine concentration of about 29 grams per liter, and a solution which is nearly saturated with lime. At this point, phenolphthalein added to the solution will show a red coloration for approximately 3 seconds before being bleached, and this is the control test commonly used. When hypochlorites are prepared under these conditions, the available chlorine content[3] should be very nearly equal to the total chlorine content—i.e., no decomposition should have occurred in preparation. The solution also will be stable on standing, and, provided the temperature is kept below 100 deg. F., may be stored for several days with little loss of available chlorine.

When hypochlorite solutions are to be prepared for shipment, it is desirable to increase the chlorine concentration as much as possible, in order to decrease transportation costs. Solutions containing up to 80 grams of available chlorine per liter may be prepared without difficulty, provided the temperature rise is not excessive. One and one-half gallons of such a solution are equivalent to one pound of liquid chlorine. At these concentrations, the end point cannot be judged by the phenolphthalein test, however, because the color is bleached almost instantaneously even in the presence of a considerable excess of lime. It is common practice to use a slurry containing lime in excess quantity and to stop the chlorination with solid lime still present. The lime is allowed to settle and the clear liquor, saturated with lime, is drawn off the top. The sludge is then washed and the excess lime recovered for subsequent use.

Transportation of hypochlorite solutions may be carried out in tank cars or tank trucks, which, for continued service, should be rubber-lined. As was mentioned above, concentrated solutions are to be desired, and by the same reasoning, calcium or sodium hypochlorite solutions are favored over chlorine water. Disregarding the corrosion difficulties involved, transportation costs will be roughly 16 times as great for chlorine as chlorine water as for chlorine in the form of calcium hypochlorite of 80 grams per liter strength.

[3] The chemical reaction involved in bleach preparation is:

$$2\ Ca(OH)_2 + 2Cl_2 \rightarrow Ca(OCl)_2 + CaCl_2 + 2H_2O$$

Available chlorine is taken in this article to include all the chlorine involved in this reaction. The total chlorine may be greater than this because of the presence of chlorate or of chloride in excess of that indicated in the equation.

Literature Cited

1. O'Neil, F. W., and Rue, J. D., *Paper Trade J.* 109, *no.* 23:39-42 (Dec. 7, 1939); *Technical Association Papers* 23:592-595 (June, 1940).
2. Whitney, Roy P., and Vivian, J. E., *Paper Trade J.* 110, 20:29-38, (May 16, 1940); *Technical Association Papers* 23:101-110 (June, 1940).
3. Whitney, Roy P., and Vivian, J. E., *Ind. Eng. Chem.* 33:741 (1941); *Technical Association Papers* 24:435-436 (June, 1941).

Brightness Standard

The Standards Committee of the Technical Association of the Pulp and Paper Industry has adopted methods for determining the brightness of papers and pulps. These have been designated as T 217 and T 452, and will be published at an early date.

These standards have been prepared to assist the industry and the Office of Production Management in its efforts to establish brightness standards for the various grades of paper.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard; Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING NOVEMBER 15, 1941

SUMMARY

Cigarette paper .....24 cs.
Newsprint .....12,952 rolls
Filter paper .....6 cs.
Drawing paper .....3 cs.
Tissue paper .....32 cs.
Decalcomania paper .....42 cs.

CIGARETTE PAPER

Gaskell & Co., Inc., ———, Barcelona, 24 cs.

NEWSPRINT

———, ———, Canada, 6,825 rolls.
H. G. Craig Co., Inc., ———, Donnacona, 274 rolls.
———, ———, Port Alfred, Que., 3,240 rolls.
H. G. Craig Co., Inc., ———, Donnacona, 295 rolls.
———, ———, Liverpool, N. S., 2,032 rolls.
H. G. Craig Co., Inc., ———, Donnacona, 286 rolls.

FILTER PAPER

H. Reeve Engel & Co., Inc., ———, Liverpool, 6 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., ———, Liverpool, 3 cs.

TISSUE PAPER

G. F. Malcolm Co., ———, Liverpool, 24 cs.
B. F. Drakenfeld & Co., ———, Liverpool, 8 cs. (pottery).

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., ———, Liverpool, 4 cs., (duplex), 38 cs., (simplex).

RAGS, BAGGINGS, ETC.

D. Benedetto, Inc., ———, Montevideo, 4 bls. rags.
Cia Gen'l Fabril Financiera, ———, Buenos Aires, 179 bls. cotton linters.
The Heyman Co., ———, Buenos Aires, 172 bls. cotton linters.
———, ———, Rio de Janiero, 95 bls. cotton residue.
Chase National Bank, ———, Rio de Janiero, 252 bls. cotton residue.
———, ———, Santos, 68 bls. picker waste, 73 bls. cotton waste, 1,657 bls. cotton linters.
West Texas Cottonoil Co., ———, Buenos Aires, 181 bls. cotton linters.
———, ———, Buenos Aires, 280 bls. cotton linters.
———, ———, Santos, 2,634 bls. cotton linters, 63 bls. picker waste.
Williamson Products Co., ——, Santos, 180 bls. cotton linters.
West Texas Cottonoil Co., ———, Santos, 4,230 bls. cotton linters.
Lush Cotton Products Co., ———, Rio de Janiero, 36 bls. cotton waste.
New England Waste Co., ———, Santos, 589 bls. cotton linters.
———, ———, Santos, 486 bls. cotton linters, 21 bls. picker waste.
Prague Credit Agency, ———, Santos, 711 bls. cotton linters.

CASEIN

Balfour Guthrie & Co., ———, Buenos Aires, 425 bags (ground), 25,500 kilos.
American Plastics Corp., ———, Buenos Aires, 1,160 bags (unground rennet), 58,000 kilos.

GLUESTOCK

Edmond J. Lang, ———, Buenos Aires, 72 bls.

BONE GLUE

Public National Bank Trust Co., ———, Santos, 200 bags.

To Discuss National Defense

Questions relative to national defense production and price stabilization will be discussed at a special meeting to be held at 9 A.M. December 3, at the Exposition of Chemical Industries, in Grand Central Palace, New York, to which exhibitors and other manufacturers will be invited.

Speakers will be: Dr. E. M. Reid, of the Chemical Section, Office of Production Management, who will discuss chemicals in relation to the defense program; Mr. Stanley Oppenheim, of the OPM Priorities Division, who will discuss general priorities and allocations; and Mr. Joel Dean, of the Industrial and Agricultural Machinery Division, Office of Price Administration, who will speak on "Price Stabilization of Machinery and Equipment."

The meeting will be under the chairmanship of Dr. H. E. Howe, editor of *Industrial and Engineering Chemistry*, who is a member of the Advisory Committee of the exposition.

The exposition, which opens in Grand Central Palace December 1, and runs through the entire ensuing week, is booked to capacity, with 335 exhibitors listed. It will be the largest industrial display in the chemical field in a decade, and the largest ever devoted exclusively to chemical products, processes and processing equipment, according to Charles F. Roth, manager.

S. J. Johnson Heads Clopay Corp.

CINCINNATI, Ohio, November 10, 1941—Sam J. Johnson, vice president of the Clopay Corporation, has been named president of the local paper products firm to succeed the late Walter Seinsheimer, it was reported last week.

Arthur L. Thexton, another vice president, was named executive vice president, and Fred H. Roth, secretary-treasurer, was elected to a new position as vice president. Mr. Roth also will continue to serve as treasurer. John S. Stark was elected secretary and A. F. Ziegler, vice president, and Louis A. Seinsheimer, chairman of the board, were re-elected.

New York Paper and Pulp Market Review

New Priority Order Reduces Use of Chlorine 50 Per Cent In Paper Industry and Defines Brightness of Major Grades—OPA Maximum Prices Prevail In Waste Paper — Other Markets Unchanged.

Office of the PAPER TRADE JOURNAL,
Wednesday, November 19, 1941.

Wholesale buying in the paper market continues to reflect the extraordinary high rate of general business activity. Reports from some quarters indicate somewhat less urgent demand for some lines of paper. This gives some support to the opinion held in some quarters that the peak of buying may have been reached and more stable conditions are likely to prevail in the future. All trade reports, however, indicate the expectation of a continued record-high demand, consumption and production of all major grades of paper and paper products.

The index of general business activity for the week ended November 8 rose to 128.2%, from 127.6% for the preceding week, compared with 116.2% for the corresponding week last year. Paper board production was 1.5% lower.

Paper production for the week ended November 8 was estimated at 104.0%, compared with 85.6% for 1940, with 98.7% for 1939, with 80.9% for 1938, and with 61.7% for the corresponding week for 1937.

Paper board production for the week ended November 8 was 97.0%, compared with 77.0% for 1940, with 83.0% for 1939, with 66.0% for 1938, and with 57.0% for the corresponding week for 1937.

Prices of paper and paper board are, according to competent trade information, well stabilized. The average representative quoted prices at resale in zone 1, on rag content bond and ledger papers, have shown only minor changes for some weeks. The same stability of prices is reflected in the average representative prices on the four grades of sulphite bond and ledger papers.

Advances in wholesale and resale prices have, of course, been reported, and in some cases individual prices have been higher, and in fewer instances, lower, than have the general average of representative quoted prices. Some advances have occurred in some grades of book paper. Moderately higher prices are now quoted in resale prices in the leading grades of glossy coated. On the other hand, prices on other grades, such as the A and B grades of S. & S.C. are practically unchanged, while No. 1 antique has reflected no important advance.

While some cases of price irregularity are always present in the paper and in all other markets, the price situation today in paper reflects the earnest efforts of this industry and trade to voluntarily keep business as regular and in as normal a condition as possible.

Chemical Pulp

No important change in the market situation in chemical pulp has been reported this week.

Director of Priorities of the OPM has issued its latest order on the use of chlorine in the paper industry, and defines brightness tests for all major grades of paper and paper board. This order cuts the normal supply of chlorine used in the manufacture of paper about 50%.

Rags

No important change in prices or in demand has been reported in any grade of new or old rags this week. Although demand is currently reported less active for roofing rags, prices hold firm at prevailing quotations.

Old Rope and Bagging

Firm prices prevail on old Manila rope, with steady mill buying taking about all available supplies.

Scrap bagging prices are weak at this date and this market is reported as a little soft. A downward revision on domestic gunny and the roofing grades, is viewed in some quarters as probably influenced by the reported threat of ceiling prices.

Old Waste Paper

OPA prices on all 34 major grades of waste paper are reported to prevail. The market is active and mill demand is heavy.

The renewed collection drives to conserve the waste paper supply of the nation, has resulted in larger stocks. Local reports, however, indicate that collections by the public total at least 15% under estimated requirements.

Twine

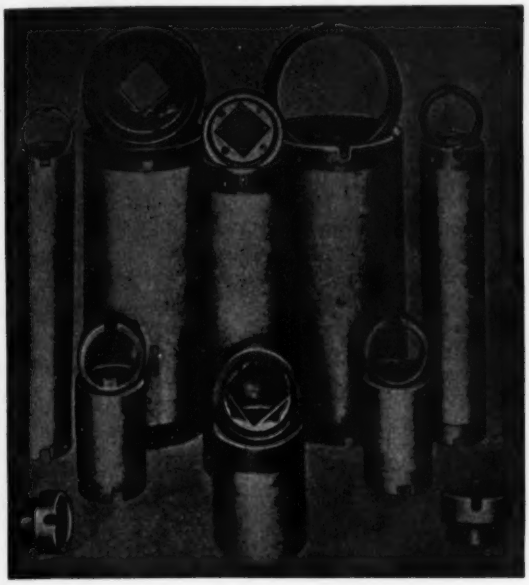
Demand continues active for most grades of twine at this date. The market is firm, with prices well maintained on all grades of hard and soft fiber twines.

Newsprint Production Rises

Production of newsprint in Canada during October 1941 amounted to 318,787 tons and shipments to 304,685 tons, according to the News Print Service Bureau. Production in the United States was 87,068 tons and shipments 87,318 tons, making a total United States and Canadian news print production of 405,855 tons and shipments of 392,003 tons. During October, 30,132 tons of news print were made in Newfoundland, so that the total North American production for the month amounted to 435,987 tons. Total production in October 1940 was 429,722 tons.

The Canadian mills produced 58,828 tons less in the first ten months of 1941 than in the first ten months of 1940, which was a decrease of two per cent. The output in the United States was 3,349 tons or four tenths of one per cent more than in the first ten months of 1940; in Newfoundland production was 585 tons or two tenths of one per cent more, making a net decrease of 54,894 tons, or one and four tenths per cent less than in the first ten months of 1940.

Stocks of news print paper at the end of October were 162,582 tons at Canadian mills and 11,614 tons at United States mills, making a combined total of 174,196 tons compared with 160,344 tons on September 30, 1941, and 198,974 tons at the end of October 1940.



ELIXMAN

CAPS

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

CORES

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.
CORINTH, N. Y.

IS THE OLD PROVERB ABOUT THE BETTER MOUSE TRAP DEAD?

● Emerson's famous proverb is not **dead** . . . just **incomplete.** For today's products, and felts in particular, must not only be **made** right, they must be **specified** right.

Here is what has actually happened when Orr Felt representatives were given the chance to analyze problems:

One representative studied a problem, selected a certain Orr suction press felt for newsprint that cut steam consumption 500 pounds per ton. Another representative suggested a change in felts for a high-speed kraft application, actually increasing machine speed 26%. And still another man recommended a change in wet felts for hi-speed tissue, resulting in an increase in average felt life of from 40% to 60%.

Orr representatives are felt experts. When one calls on you, let him put his unique knowledge to work for you. His suggestions have often led to valuable savings.

ORR FELTS

THE ORR FELT and BLANKET CO.
PIQUA, OHIO

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, November 19, 1941.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. Demand reported good for the week. The pulp is currently quoted at $40 per ton in barrels, at works; the powder is offered at $60 per ton, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are firm. Market reported active for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are firm. Demand reported good for the week. Standard domestic casein, 20-30 mesh, is currently quoted at 28 cents per pound; 80-100 mesh, at 28½ cents per pound; all prices in bags, car lots. Standard Argentina casein is currently offered at 22 cents per pound. No quotations on French casein.

CAUSTIC SODA—Prices on caustic soda are reported firm. Demand active for the current week. Solid caustic soda is currently quoted at $2.30 per 100 pounds, flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged this week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine unchanged. Market under full priority control. Chlorine is currently quoted at from $1.75 to $2 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on some grades of rosin are higher for the week. "G" gum rosin is currently quoted at $2.55 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $2.58 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $3.03 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand active, with current quotations nominal. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $16 per ton on imported salt cake continues nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand reported active. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are firm and continue unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Market reported tight. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.85 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices of sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@$6.00	
Superstandard	4.87½	" 5.25	
Northern Standard Wrapping	4.50	" 5.00	
Standard Wrapping	4.50	" —	
Tissues—Per Ream—Carlots			
White No. 1	1.07½	" —	
White No. 1 M. G.	.97½	" —	
White No. 1½	.85	" —	
White No. 2	.85	" —	
Anti-Tarnish M. G.	.90	" —	
Colored	1.00	" —	
Kraft	.90	" —	
Manila	.80	" —	
Unbl. Toilet, 1 M.	4.14	" —	
Bleached Toilet	5.60	" —	
Paper Towels, Per Case—			
Unbleached, Jr.	3.80	" —	
Bleached, Jr.	2.30	" —	
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.75	@10.75	
No. 1 Manila Wrapping, 35 lb.	5.50	" 5.75	
No. 2 Manila Wrapping, 35 lb.	5.25	" 5.50	
Boards, per ton—			
News	*45.00	@ —	
Chip	*45.00	" —	
Sgl. Mla. Ll. Chip	*60.00	" —	
White Pat. Coated	*75.00	" —	
Kraft Liners 50 lb.	*60.00	" —	
Binders Boards	*80.00	" —	

* OPA Maximum Prices.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext.	No. 1 $40.25@$47.25	$41.40@$48.50
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	32.20 " 37.75
75% Rag	24.75 " 29.00	25.90 " 30.50
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—
White, Assorted Items.
Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper.
Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@$15.50
No. 2 Glossy Coated	12.40 " 14.00
No. 3 Glossy Coated	11.60 " 13.25
No. 4 Glossy Coated	11.15 " 12.75
No. 1 Antique (watermarked)	10.25 " 11.75
No. 2 Offset	9.60 " 11.00
A Grade E. F.	9.35 " 10.75
A Grade S. & S. C.	9.60 " 11.00
B Grade E. F.	8.85 " 10.25
B Grade S. & S. C.	9.10 " 10.50
C Grade E. F.	8.55 " 9.75
C Grade S. & S. C.	8.80 " 10.00
D Grade E. F.	8.29 " 9.50
D Grade S. & S. C.	8.50 " 9.75

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—	
Moist	No prices
Dry	No prices

(Delivered)

No. 1 Domestic and Canadian	40.00 @42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—		
Prime Bleached Sulphite	3.62½	@ 4.75
Prime Qualities—		
Easy-Bleaching Sulphite	3.17½	" 4.25
Strong Unbleached Sulphite	3.17½	" 4.25
News Grade, delivered		
Unbleached Sulphite	63.75	" 67.75

(On Dock, Atlantic Ports)

Kraft Bleached	4.12½	" —
Kraft Light & Strong	No price	
Kraft No. 1	3.60	" 4.75

(F. o. b. Pulp Mill)

Kraft Domestic and Canadian	3.00	" 3.50

(Delivered)

Soda Bleached	3.30	" —

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	8.00	@ 8.25
Silesias No. 1	4.50	" 4.75
New Unbleached	8.00	" 8.25
Blue Overall	5.75	" 6.00
Fancy	3.00	" 3.25
Washables	2.50	" 2.75
Mixed Khaki Cuttings	2.50	" 2.75
O. D. Khaki Cutings	3.00	" 3.15

Old Rags

White, No. 1—		
Repacked	3.75	" 4.00
Miscellaneous	3.25	" 3.50
White, No. 2—		
Repacked	2.50	" 2.75
Miscellaneous	2.00	" 2.25
Third and Blues—		
Repacked	1.25	" 1.35
Miscellaneous	1.10	" 1.25
Roofing Rags—		
No. 1	1.50	" 1.60
No. 2	1.35	" 1.50
No. 3 (bagging)	.95	" 1.00
No. 4	.90	" .95
No. 5A	.90	" .95

Foreign Rags

All prices nominal

New Rags

New Dark Cuttings	2.25	@ 2.40
New Mixed Cuttings	2.00	" 2.20
New Light Silesias	5.50	" 5.75
Light Flannelettes	5.50	" 5.75
New White Cuttings	7.00	" 7.50
New Light Oxfords	4.00	" 4.50
New Light Prints	3.00	" 3.25

Old Rags

No. 1 White Linens	7.50	" 8.50
No. 2 White Linens	6.50	" 7.50
No. 3 White Linens	4.50	" —

More than just a TRADE MARK

EXCELSIOR KNOX Woolen Co. Camden, Me. FELTS & JACKETS

BUT also a guarantee by men who for 75 years have prided themselves in making finer felts. TO YOU —this is the mark of dependability, longer felt life and greater saving.

KNOX WOOLEN CO.
CAMDEN, MAINE.

West Virginia Pulp and Paper Company

230 Park Ave.
New York

35 East Wacker Drive
Chicago

Public Ledger Building
Philadelphia, Pa.

503 Market St.
San Francisco, Cal.

Manufacturers of

ENGLISH FINISH SUPERCALENDERED MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

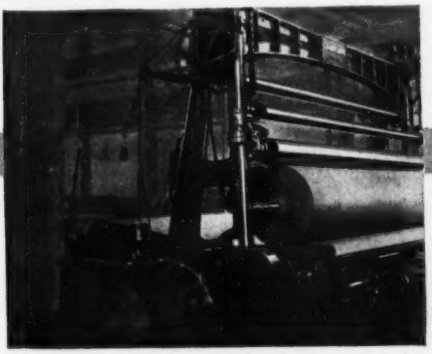
HIGH GRADE COATED BOOK

. . . .

KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina



A WINDER MAN SPEAKS HIS MIND

"Just a few lines in regard to operation and qualifications of a No. 20 Winder installed on high-speed paper machine here. Inside of six hours we ran 112 sets of 15" diameter rolls; and, if you know of a winder that can beat that, please notify me. I want to see it.

(Signed) Winder Man
(Name on Request)

P.S. This is no brag or boast about my record or winder crew's record. We just want you to know what a real winder we have."

Write for interesting illustrated folder describing Camachine 20 to CAMERON MACHINE COMPANY, 61 Poplar Street, Brooklyn, N. Y.

CAMACHINE

PRICE & PIERCE ltd

Wood Pulp & Paper Agents

60 EAST 42 ST NEW YORK CITY

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens.	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging
(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.00	@	4.25
Wool Tares, light....	4.25	"	4.50
Wool Tares heavy..	4.50	"	4.75
Bright Bagging.....	3.50	"	3.75
Manila Rope			
Foreign	6.50	"	6.75
Domestic	6.50	"	6.75
Jute Threads.....	4.00	"	4.25
Sisal Strings.....	2.75	"	3.00
Mixed Strings.....	1.10	"	1.20

Old Waste Papers
(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard Colored Envelope Cuts....	3.12½	"	—
No. 1 Hard White Shavings, unruled.	2.87½	"	—
No. 1 Hard White Shavings, ruled...	2.50	"	—
Soft White Shavings, one cut.....	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings..	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines.....	1.57	"	—
Mixed Books.....	1.07½	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut..	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas.....	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft.	2.50	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Old Kraft Corrugated Containers	1.35	"	—
New Corrugated Cuttings	.90	"	—
Old Corrugated Containers	.82½	"	—
Box Board Cuttings.	.72½	"	—
White Blank News.	1.65	"	—
Overissue News.....	.85	"	—
No. 1 Baled News..	.75	"	—
Super Mixed Paper..	.70	"	—
No. 1 Mixed Paper.	.65	"	—

Twines
(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp.....	.21	"	—
Fine Polished—			
Fine India.....	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers.....	.17	"	—
Tube Rope.....	.19	"	—
Wall Paper.....	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope...	.19	"	—
Cotton	.25	"	—
(Hard Fiber)			
Medium Java.....	.18	"	—
Mex. Sisal.....	.16	"	—
Manila	.26	"	—

PHILADELPHIA

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1.	.07¼	@	.07½
New White No. 2.	.04½	"	.05
Light Silesias.....	.04½	"	.04¾
Silesias, No. 1....	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached..	.07¼	"	.07½
Washable Prints...	.03¾	"	.03½
Washable No. 1..	.02	"	.02¼
Blue Overall.....	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales....	.03¼	"	.03½
New Black Soft...	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.....	.03	"	.03¾
No. 2 Mixed.....	.02¼	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas.....	.04¾	"	.05¼
New Black Mixed.	—	"	.02½

Domestic Rags (Old)

White No. 1—			
Repacked	3.25	@	3.75
Miscellaneous	3.00	"	3.25
Thirds and Blues—			
Miscellaneous	2.00	"	2.25
Repacked	2.25	"	2.50
Black Stockings (Export)	Nominal		
Roofing Stock—			
Foreign No. 1....	Nominal		
Domestic No. 1...	1.95	"	2.00
Domestic No. 2...	1.80	"	1.85
Roofing Bagging..	1.70	"	1.75

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	Nominal		
Domestic	3.25	"	3.50
Manila Rope.....	5.00	"	5.50
Sisal Rope.....	3.75	"	—
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	3.75	"	4.00
No. 2.....	1.75	"	1.80
Wool Tares, heavy...	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers
(F. o. b. Phila.)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled.	2.87½	"	—
Soft White Shavings, one cut.....	2.87½	"	—
White Blank News..	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger.	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines.....	1.57	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper.	.65	"	—
Super Mixed Paper..	.70	"	—
Box Board Cuttings.	.72½	"	—
New Corrugated Cuttings	.90	"	—
Overissue News.....	.85	"	—
No. 1 Baled News...	.75	"	—

BOSTON

Old Papers
(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled.	2.87½	"	—
No. 1 Hard White Shavings, ruled...	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut.....	2.87½	"	—
Hard White Envelope Cuts, one cut.....	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft.	2.50	"	—
Mixed Kraft Env. & Bag Cuttings.....	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines.....	1.57	"	—
New Manila Envelope Cuts, one cut.....	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News..	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper.	.65	"	—
Super Mixed Paper.	.70	"	—
Overissue News.....	.85	"	—
Box Board Cuttings.	.72½	"	—
Old Kraft Corrugated Containers	1.35	"	—
Old Corrugated Containers	.82½	"	—
New Corrugated Cuttings	.90	"	—

Bagging
(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	4.75	@	5.00
Sisal Rope.....	3.50	"	4.00
Mixed Rope.....	1.00	"	1.25
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Soft Jute Rope.....	5.00	"	5.50
Manila Rope—			
Foreign .....(nominal)			
Domestic	6.50	@	6.75
Jute Carpet Threads.	3.00	"	3.25
Bleachery Burlap....	7.50	"	8.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	6.50	"	6.75
Scrap Sisal.....	3.25	"	3.50
Scrap Sisal for Shredding	3.75	"	4.00
Wool Tares—			
Foreign	(nominal)		
Domestic	5.00	"	5.50
Aust. Wool Pouches.	5.10	"	5.25
New Burlap Cuttings	5.75	"	6.00
Heavy baling bagging	4.75	"	5.00
Paper Mill Bagging..	3.25	"	3.50
No. 2 Bagging.....	.50	"	.60

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.04½	@	.04¾
Fancy Percales....	.04¼	"	.05
New White No. 1.	.07¾	"	.08
New Light Flannelettes	.06	"	.06¼
Canton Flannel, Bleached	.08¼	"	.08½
Underwear Cutters, Bleached	.08½	"	.08¾
Silesias No. 1.....	.04½	"	.05
New Black Silesias..	.04¼	"	.04½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached....	.08½	"	.08¾
Blue Cheviots....	.04¾	"	.05
Fancy	.01¾	"	.02
Washable	.01¾	"	—
Cottons—According to Grades—			
Blue Overalls.....	.06	"	.06¼
New Black, Soft..	.03¾	"	.04
Khaki Cuttings.....	.02¼	"	.02½
O. D. Khaki.....	.02½	"	.03¼
Corduroy	.02	"	.02¼
New Canvas.....	.05½	"	—
B. V. D. Cuttings...	.07¾	"	.08

Domestic Rags (Old)
(F. o. b. Boston)

White No. 1—			
Repacked	4.00	@	—
Miscellaneous	3.00	"	—
White No. 2—			
Miscellaneous	2.50	"	3.00
Twos and Blues.....	1.75	"	2.00
Old Blue Overalls...	2.25	"	2.50
Thirds and Blues....	1.75	"	—
Miscellaneous	1.25	"	1.35
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.80	"	—
No. 2.....	1.60	"	—
No. 3.....	1.50	"	—

Foreign Rags
(F. o. b. Boston)

Canvas .....(nominal)	
Dark Cottons.....(nominal)	
Dutch Blues.....(nominal)	
New Checks and Blues(nominal)	
Old Fustians.....(nominal)	
Old Linsey Garments.(nominal)	
New Silesias.....(nominal)	

CHICAGO

Waste Paper
(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled.	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines.....	1.57	"	—
White Blank News..	1.65	"	—
Mixed Kraft Env. & Bag Cuttings..	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News.....	.85	"	—
No. 1 Baled News..	.75	"	—
No. 1 Mixed Paper..	.65	"	—

REDUCES CALL TO THREE MONTHS

(Continued from page 7)

specified in each item or none at all or it may order up to a one hundred and fifty per cent of such quantity, and arrangement which leaves suppliers in doubt as to what call will actually be made under the contract. It was pointed out that while in normal times with an adequate supply of paper this provision is not objectionable nevertheless during the emergency period with a prospective shortage of paper the clause might have a bad effect on bidding. For that reason the Government has reduced this overrun to ten per cent.

While the representatives expressed the belief that bids would be received on the specifications as printed, it was the unanimous view of the seventy-six men present that these two provisions should be modified in the specifications in the mutual interest of the industry and the Government.